

THE

MEDICAL JOURNAL OF AUSTRALIA

(With which "The Australasian Medical Gazette," and "The Australian Medical Journal" are incorporated.)

The Journal of the Australian Branches of the British Medical Association.

VOL. II.—4TH YEAR NO. 19.

SYDNEY: SATURDAY, NOVEMBER 10, 1917.

PRICE 6D.

DEC 27 1917

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No. 13.

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No. 19.

GUNSHOT WOUNDS OF THE PERIPHERAL NERVES AND THEIR SURGICAL TREATMENT.

By Geoffrey Owen, M.D.,

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Wounds of the limbs naturally comprise a large number of the various war wounds, and it necessarily follows that a considerable number of cases of wounds of the peripheral nerves of more or less severity are met with.

During the last twenty-two months, while working in the surgical wards of several base hospitals, I have had a large number of these cases under my care, and in this paper I have endeavoured to give some record of the various conditions met with, to outline the main clinical features briefly, and also to give some account of the surgical treatment which has been followed and the results that have been obtained. As a general rule, nerve injuries of this war must be treated almost entirely at the base hospitals, the condition of the wounds being, as a rule, quite unsuitable for immediate suture. Absolute asepsis must be the underlying factor of success in nerve surgery, and in the majority of cases operative measures must be postponed until the wounds are completely healed. In rare instances the opportunity to perform an immediate suture may present itself at a casualty clearing station, and during the last few weeks while acting as second Surgeon to No. 1 Australian Casualty Clearing Station this chance has been afforded me. Both cases were clean bullet wounds and the patients were received at the station within about three hours of being wounded. The first case was a through-and-through bullet wound of the elbow with complete shattering of both the condyles and evidences of ulnar nerve division. In this case I did a resection of the joint and a primary suture of the ulnar nerve which was completely divided. First intention healing was obtained and the patient evacuated twelve days later. The second case was another clean bullet wound of the upper fibular region, in which, after complete exposure of the bullet track and removal of injured bone, I did an immediate end-to-end suture of the external popliteal nerve and here also obtained immediate healing. With the exception of these two, the whole of the fifty-seven cases on which this article is based were operated on at the English base.

There are three main types of injuries to be recognized:—

1. *Complete division of the nerve.* The severed ends becoming involved in the septic process which almost always follows the wound, adhesions are formed between the trunk and the surrounding structures, and at the same time the nerve ends undergo an inflammatory change, becoming thickened and bulbous, so that the condition found at operation some months later, is one of more or less dense adhesions, with retracted more or less fibrotic bulbous

nerve endings. In some instances, one or two inches of the nerve trunk may be completely shot away.

2. *Incomplete division* and bruising of the nerve, followed by fibrous adhesions of the trunk to the surrounding structures and the formation of thickened fibrotic nodules at the seat of injury. In these cases the density of the adhesions varies greatly, depending largely on the intensity of the septic process, the fibrous tissue formed anchors the nerve trunk down to the surrounding structures, and by its contraction exerts an injurious pressure on uninjured healthy nerve fibres. Frequently one finds a small part of the circumference of the trunk replaced by a hard fibrous patch, the remainder being normal. In the case of nerves carrying many sensory fibres, there is frequently severe pain referred to the peripheral distribution, due to the neuritis set up in the trunk.

3. *Nerve shock* in which there is no actual visible wound of the nerve trunk, but in which the missile has exerted some influence on the nerve during its passage through the limb, giving rise to signs and symptoms very similar to those of complete division. Strictly speaking, this class of case does not come within the category of this paper, seeing that the nerve has not undergone any visible physical injury, and no surgical intervention is required, but at the same time it is a type of injury of extreme importance to recognize both as regards prognosis and treatment. A typical case may be stated as follows: A soldier receives a bullet wound through the back of the arm, followed by a complete paralysis of all the extensors of the wrist and fingers. The wound, being a clean bullet wound and perhaps healing completely at the end of three weeks, the musculo-spiral nerve is exposed, and an apparently healthy trunk, with no sign of injury, discovered, it being found that the bullet track just missed the nerve. The condition of nerve shock is one of extreme interest, and its exact nature remains to be worked out more fully; but there can be no doubt that the axis cylinders undergo some definite shock from the passage of a high velocity missile in their vicinity. It is highly important to recognize this class of case, as no surgical intervention is required, and recovery usually follows proper treatment. The recognition of the condition is based on the following considerations: Firstly, a careful review of the anatomy of the wounds may lead to the suspicion that the nerve trunk cannot have sustained any direct physical injury. Secondly, the electrical examination of the muscles will not show the complete reaction of degeneration found in cases of total division. Thirdly, these cases nearly all show signs of definite improvement within six weeks, if placed under suitable electrical treatment, not necessarily a return of voluntary power, but an improvement in the electrical reactions, in direct contra-distinction to a dividing lesion, in which the changes are more marked at the end of six weeks. It is only rarely that a wound is sufficiently healed to justify operation within six weeks. If, after that

period of electrical treatment, there is no sign of improvement, any question of nerve shock may be eliminated, and a definite injury diagnosed.

A definite diagnosis of injury to a nerve having been made, surgical intervention is indicated, and the sooner this can be carried out the better for the patient, but it is absolutely essential that all sepsis be cleared up and the wounds firmly and securely healed before anything is attempted. The question of wound treatment does not come within the scope of this paper; it must be carried out on the usual lines. At the same time, it may be noted that these cases may be treated by iodide ionization in the latter stages, which treatment tends to lessen and, at the same time, soften the fibrous tissue formation. This procedure was carried out in several of my cases at the Epsom War Hospital, and appeared to have a considerable beneficial effect. The wound must be firmly healed before any operative measures can be thought of. In cases of only slightly septic wounds, where rapid healing is obtained, it is permissible to operate after the wound has been healed a week or ten days. On the other hand, in cases of prolonged suppuration it is necessary to wait for the wound to be healed at least four to six weeks before attempting surgical measures. In many of these cases it is found that the wounds break down at the end of a week's apparent healing, showing some latent sepsis still lurking underneath. Operative measures undertaken in these conditions will certainly be followed by septic infection and a complete failure of any nerve repair.

The diagnosis of these cases present no difficulty. An accurate anatomical knowledge of the motor and sensory distribution of the various nerves is essential. A careful examination from the anatomical standpoint, followed by a thorough electrical testing of the various muscles affected, will give one a fairly exact idea of the state of affairs.

The time that elapses while the surgeon awaits the healing of the wound should be occupied in carrying out the following objects: (1) The maintenance of the nutrition of the paralysed muscles. This preliminary treatment is most important, if ultimate good results are to be obtained. Obviously, it is of little value to repair the nerve conductivity, unless, when this is accomplished, there are some muscle fibres remaining to act upon. To this end the affected muscles should be regularly submitted to a course of massage and carefully regulated electrical treatment, and this can usually be carried out without in any way interfering with the treatment of the original wound.

(2) The correction of any deformity and the prevention of stretching of the affected muscles. This is also very necessary, and the two indications are usually carried out simultaneously. It has long been recognized that degenerative changes in paralysed muscles are encouraged by keeping the affected muscles stretched, and that, to obviate this, the latter should always be kept in a relaxed position. The correction of any deformity is usually carried out by the same measures as those employed for the relaxation of the paralysed muscles, e.g., the arm in wrist-drop is at once placed on a Jones' splint, which cor-

rects deformity and relaxes the extensors. It is obvious that any nerve repair will be of little avail if the affected limb has been allowed to become fixed in a vicious position and the muscles injured by continual overstretching of the opposing group.

Treatment.

There can be no doubt that, once the diagnosis of a definite nerve injury is established, and the original wound sufficiently healed to warrant surgical interference, the sooner the operation is done, the better chance the surgeon has of a satisfactory result. It seems hardly necessary to insist that the strictest aseptic precautions are necessary in all nerve work; failure of asepsis means a complete failure of the operative measures, and a reformation of dense adhesions and fibrous tissue in and around the nerve endings. The incision made to expose the damaged area will vary greatly with the position and direction of the original wounds. In some cases the incision need not approach the healed wound, but is carried through normal skin. In other cases, where it is necessary to incise in the line of the original wound, I always make an especial point of excising the healed wound completely, as there can be no doubt that these war scars not infrequently contain latent organisms, which lead to subsequent sepsis. "Never cut into a war scar" is a very good rule to follow in secondary war surgery. The necessary dissection for exposing the nerve is frequently slow and tedious, but the operation can be immensely simplified by always exposing the normal nerve above and below the lesion, and then following the track in both directions towards the area of damage. I learned the value of this plan at Harefield in 1915, and have found it of immense help. Any attempt to go straight down into the lesion usually leads to a long and tedious dissection, ending in failure to recognize the damaged nerve trunk from fibrous tissue, whereas the method mentioned above obviates this difficulty. The nerve lesion having been satisfactorily exposed (and here it may be advised that large incisions and a thorough exposure are to be recommended), the line of treatment to be carried out varies with the pathological condition found. In the first class of case mentioned in the earlier part of this paper, with complete division of the trunk and fibrous-bulbous endings, these endings must be removed up to the point where healthy nerves can be demonstrated (*i.e.*, in the proximal trunk), and an end-to-end suture done. This procedure necessarily leads to some shortening of the trunk, and approximation may be difficult; but this can often be overcome by putting up the limb temporarily in a position which relaxes the tension. In other cases, I have secured union by the recognized procedure of splitting the trunks, while in rare cases, where large lengths of nerve have been shot away, the only possible course has been to anastomose the two ends of the injured nerve into an adjoining nerve. The union in most cases has been made by passing one fine catgut stitch in a round needle through the nerve trunk, and then a series of fine catgut stitches through the sheath only. Where there has been much tension I have used fine silk for the sheath sutures, but prefer to avoid this material, if possible, in all

nerve work. Careful and accurate apposition having been obtained, the junction should be protected, so as to minimize, as far as possible, the formation of adhesions. This can be done by wrapping adjacent muscle or adipose tissue round the nerve. In most of my cases, I have used Cargile membrane, wrapped completely round the junction and secured with a fine catgut stitch, and have had very satisfactory results from the use of this tissue. The second class of case, in which there is no complete division, but only a bruised nerve with adhesions, is more easily healed. Here it is usually only necessary to separate the adhesions carefully, to free the nerve from all fibrous contracting bands, and to wrap the damaged area with Cargile membrane. In most cases, this is followed by very satisfactory results. While referring to this class of case, I should like to mention an interesting and, I think, original observation, which was made by Dr. Burke (Electro-Neurologist at Epsom) and myself while testing electrically the nerve trunk exposed at operation. We found that the response to electrical stimulation (many of these partial cases give some response) was markedly increased immediately the constricting adhesion had been removed. This observation was made by us on several occasions, and explains the satisfactory results frequently obtained when the pressure is removed.

After-Treatment.

Suitable after-treatment in these cases is most important, and, unless it can be carried out in a satisfactory manner, good results cannot be hoped for. The same carefully-supervised electrical treatment and massage and the same correction of overacting muscles and deformities as was laid down for the period prior to operation, must be carried out regularly and conscientiously if good results are to be obtained. The difficulty lies in the fact that this treatment needs to be carried out for a long time, and that patients cannot be kept in military hospitals indefinitely.

Prognosis.

The results which have been obtained in these cases are difficult to estimate correctly. In the first place, it is impossible to give any final opinion as to the result of a nerve operation for at least twelve months, and even longer, in some cases. In the second place, there is the greatest difficulty in keeping track of these cases. The men get scattered to the various parts of Britain and the Dominions, and frequently fail to keep us posted as to their condition, in spite of their promises and the surgeons' entreaties. As a general rule, we may say that, in the cases with only partial division and adhesions, good results may be looked for. In cases of complete division, the prognosis must be more guarded, and we must be prepared for a long wait and a long, conscientious after-treatment. There recently appeared in the *British Medical Journal* a paper quoting several instances of return of power in cases of nerve suture (in one case of nerve implantation) within a few days of the operation. My only reply to this record would be that, during the last two years, it has never been my experience or good fortune to see the slightest recovery in a completely divided nerve within six months, and,

generally, it is fully twelve months before any definite signs of returning voluntary power can be looked for.

This paper is based on fifty-seven cases of nerve injuries in which I have operated during the last two years at different military hospitals. It is obviously impossible to record each case exactly, and it has been thought better to divide these cases into groups, according to the different nerves affected, and to quote one or two clinical records of each.

1. Injury to Brachial Plexus. (Two cases.)

Several examples of this injury have passed through my hands; but only two have been operated on. It has been found, as a general rule, that these cases are not very suitable for surgical treatment, and, further, that many show a definite tendency towards fair recovery without operation. In the following two cases, surgical interference was definitely indicated, owing to persistent pain.

Case 1.—Private J. M., 6th K.O.S.B., admitted to Epsom War Hospital in April, 1916, having been wounded some three weeks previously. The wound of entry was just to the left of the mid-line of the neck below the cricoid cartilage, and two pieces of shrapnel were located in the left posterior triangle, where there was considerable swelling but no evidence of injury to the subclavian. Examination showed marked loss of power in all the muscles of the left arm and partial reaction of degeneration, which became complete in certain groups within three weeks' time. The patient complained of severe and increasing pain in the forearm and hand. Six weeks later, the wound having quite healed, and the pain being persistent, the posterior triangle of the neck was exposed and the plexus explored. The three cords were found to have been bruised and surrounded by a mass of fibrous tissue, but none divided. One piece of shrapnel was lying between the cords and the other near the subclavian artery. A long and tedious dissection was necessary to define and free the cords satisfactorily; after which, the incision was closed. The operation was followed by marked relief of pain. At the end of three months, when he was discharged, there was improvement in the electrical reactions, and a return of voluntary power in certain muscle groups, while the pain had completely disappeared. The patient did not report his future progress, but the prognosis may be considered good.

Case 2.—Private M., Warwicks, wounded on September 21, 1915, and admitted to Epsom 10 days later. The wound of entry was 2.5 cm. (1 inch) below the outer end of the right clavicle. There was a fracture of that bone and marked loss of power in all the muscles of the right arm with considerable referred pain similar to that in Case 1. X-ray examination showed a comminuted fracture of the clavicle with some backward displaced fragments and several small pieces of metal. The wound being healed at the end of six weeks, an incision along the outer half of the clavicle was made and the callus divided, when it was found that several small pieces of bone had been driven backwards into the plexus. By extending the incision upwards and downwards, the whole course of the brachial cords could be followed. They were found surrounded with fibrous tissue, and had been considerably bruised but not divided; and several small, sharp pieces of bone were removed from among them, and also two pieces of bomb-casing. The cords were completely freed, each wrapped round with Cargile and the clavicle wired into good position. The large vessels were kept well out of the way during the operation and gave no trouble, but the whole procedure was a tedious and lengthy one. The patient made an excellent recovery. The pain was much relieved at once, and three months later voluntary power was rapidly returning in the limb. Six months later he wrote that he was quite free

from pain and his arm and fingers, though weak, were quite useful.

2. Injuries to Nerves Between the Clavicle and Lower Axillary Fold. (Seven cases.)

These seven cases are of extraordinary interest, but I shall confine myself to giving clinical records of two only. In operating on these cases, I have followed the same plan in each, i.e., making an incision from just outside the middle of the clavicle, along the interval between *pectoralis major* and the deltoid, and down the arm to well below the axillary fold. The cephalic vein and humeral branch of the acromio-thoracic artery being identified and protected (marked enlargement of this vein usually means injury to the axillary vein), the skin and fat over the *pectoralis major* is reflected forwards, and the twisted tendon of that muscle carefully identified and divided 2.5 cm. (1 inch) from its insertion into the bicipital ridge. The axilla, with its various nerves and vessels, is thus completely opened up, and a free field for operation obtained. After the necessary procedures are finished, the *pectoralis* tendon is carefully sown together with catgut sutures. I have never seen any disability resulting from this operation, and the advantages obtained in working on this somewhat difficult area are very great.

Case 3.—Private B., A.I.F., was wounded at Gallipoli on May 15, 1915, and was admitted to Harefield on July 7, with a healed bullet wound of entry over the left pectoral region, and a wound of exit at the back of the arm. There was considerable loss of power and reaction of degeneration in all the muscles supplied by the ulnar nerve and marked weakness in the median group, the musculo-spiral and musculo-cutaneous groups being intact. The radial pulses were equal. The incision described in the preceding paragraph was made, and it was noted at the time that the cephalic vein was much enlarged. On reflecting the *pectoralis*, the following condition was disclosed after much tedious dissection. The median nerve was scarred and surrounded by fibrous tissue, while the ulnar was completely divided, its upper end being adherent to the median and its lower end firmly fixed to the axillary artery. The axillary vein was represented only by a fibrous cord, and had evidently been badly wounded and had become thrombosed and fibrosed. The median was freed from adhesions, the ends of the ulnar nerve dissected out, an end-to-end union done and the *pectoralis* tendon sutured. First intention healing was obtained, but owing to my transfer from Harefield some weeks later and the patient's return to Australia, further records of progress are not available.

Case 4.—Private H., K.R.R., was wounded in January, 1916, and was admitted to Epsom Hospital some days later. The bullet wound of entry was situated over the left deltoid, and the wound of exit just below the anterior axillary fold. Loss of power and reaction of degeneration were noted in all ulnar and median groups and some weakness in the musculo-spiral group. The radial pulses were equal. An operation was undertaken on March 12, 1916. An aneurysm was disclosed of the second part of the axillary artery about the size of a small marble, with the two heads of the median nerve spread out over the sac and adherent to it, but not divided. There was slight thickening in the axillary vein opposite to the aneurysm. The ulnar nerve had been completely divided and the two ends were adherent to the sac; posteriorly there were a few adhesions to the musculo-spiral nerve. The artery was tied above and below the sac, the median heads carefully dissected off and the sac removed. The two ends of the ulnar nerve were freed and united, the musculo-spiral freed and each nerve wrapped in Cargile tissue. This patient was kept under view for some time, and showed marked improvement in the median and musculo-spiral groups, but there was no evidence of ulnar regeneration eight months after operation.

These two cases are fairly typical of injuries to this region, where the surgeon must be prepared to find complicated lesion of vessels and nerves, needing a careful and tedious dissection.

3. Injuries of Various Nerves of the Upper and Lower Limbs.

(1) Median (8 cases).—This nerve is frequently damaged in wounds of the upper arm and forearm, and in the former situation, owing to its anatomical relation to the brachial artery, there is frequently some associated injury to that vessel, and not infrequently damage to the ulnar nerve also. Owing to the large number of sensory fibres carried in this trunk, partial lesions are usually associated with severe neuralgic referred pain.

Case 5.—Corporal E. B., H.L.I., was wounded on September 25, 1915, and was admitted to Epsom Hospital on September 29, with a bullet wound through the middle of the left upper arm and complete motor and sensory median paralysis. The wounds had healed in four weeks, when there was complete reaction of degeneration in all the median groups. At the operation, performed on November 7, the median nerve was found completely divided, and surrounded by scar tissue and the upper end adherent to the brachial artery. The nerve was freed, the damaged ends removed, union carried out and the junction wrapped in Cargile tissue. No improvement was detected in February, 1916. In April, 1916, there were slightly improved clinical reactions, but there was no voluntary power. Further electrical improvement took place in July and there was slight voluntary power. The electrical reaction was approaching normal in November, 1916, the anaesthesia had disappeared, and there was weak voluntary power in all muscles. The patient wrote in March, 1917, that the forearm and hand were almost normal.

Case 6.—Sergeant M., Canadians, was wounded in February, 1916, and admitted a few days later with a through-and-through shrapnel wound of the upper right forearm. He complained of severe neuralgic pain referred to the area of the median nerve supply. There was slight weakness of the median muscles, but no reaction of degeneration at the end of four weeks, when the wounds were healed. The nerve was exposed and found to be involved in adhesion between the two heads of the *pronator radii teres*, where the shrapnel had bruised the edge of the nerve and caused a fibrous thickening in the sheath. The trunk was freed from adhesions, and was wrapped in Cargile tissue. Three months later the pain had completely disappeared and the muscular power was normal.

(2) Ulnar (7 cases).—This nerve is not infrequently implicated in wounds of the upper arm, and this implication is often met with in injuries to the elbow joint (see case quoted from the 1st Australian Casualty Clearing Station), and in wounds of the forearm. The clinical conditions met with are exactly similar to the two types of injury described under the heading of the median nerve, and it hardly seems necessary to quote them in detail. Four were cases of complete division, one of which showed an almost complete recovery at the end of twelve months; a second case showed no change after nine months, and the two others were lost sight of.

(3) Musculo-spiral (13 cases).—Injuries to this nerve have been far more frequent than any other, due to its intimate association with the humerus, which bone has so frequently been damaged in this war. In many cases the lesion has been secondary to the bony damage, and was not directly due to the missile, the type of case more nearly approaching that seen in civil surgery. Owing to the nature of the

injury, it frequently happens that a considerable length of the nerve is destroyed and missing and the difficulties of the operation correspondingly increased.

Case 6.—Private W., A.I.F., was wounded at Gallipoli on May 2, 1915, and was admitted to Harefield on August 16, with a compound fracture of the right humerus. The wounds were healed, and the bone in good position. There was complete paralysis of the *supinator longus* and all the extensors, and reaction of degeneration in all those muscles. A long incision was made over the back of the arm, the nerve was exposed, and was found to be adherent to the bone and completely divided. After much difficulty an end-to-end suture was carried out, but the upper end of the nerve was much scarred and damaged, and the outlook was considered doubtful. One year later I heard by letter from this patient that he could extend his wrist slightly, but unfortunately he has not written again. Since this time, I have operated in five other almost similar cases at Harefield; all the patients have returned to Australia and unfortunately have been lost sight of.

Case 7.—Private C., A.I.F., was wounded at Flers on November 16, 1916, and was admitted to 3rd Australian Auxiliary Hospital, Dartford, on February 2. This case was very similar to the former one. There was a compound fracture of humerus, with an adherent torn nerve, but in this instance, when the nerve had been freed from adhesions to the bone and muscle and the torn damaged ends removed, it was found that fully 5 cm. (2 inches) were missing and approximation quite impossible. I therefore split the upper end of the nerve and turned down one half to form a union with the lower end, the suturing being done with very fine catgut and very small needles. In this case the prognosis must be considered doubtful, but as the patient comes from my own district in Australia, I shall be able to verify any change in the future.

The following case of partial lesion gave a good result:—

Case 8.—Lance-Corporal L., A. & S.H., was wounded on September 25, 1915, at Loos, and was admitted to Epsom on October 14. There was a compound fracture of the humerus at the junction of the lower and middle thirds. The bones were in bad position, and the musculo-spiral nerve was involved. Two weeks later, the wounds being well healed and the extensor muscles showing a partial reaction of degeneration, the nerve was exposed, and found to be involved in adhesions in the lower part of the groove and in the interval between the *brachialis anticus* and *supinator longus*. The adhesions were freed and the nerve held aside, while I chiselled through the callus, reduced the deformity and plated the ends of the bone in good position. A layer of muscle was sewn over the plate and the nerve wrapped in Cargile tissue. Four months later there was good return of voluntary power. The partial reaction of degeneration had disappeared, and there was an excellent union of the humerus in good position.

(4) **Posterior Interosseous.**—This nerve is not very favourable for operative interference. It is deeply placed, and, in addition to this, the trunk breaks up into its various branches so soon that it is often found that the damage is limited to the nerve supply of one or more muscles, the others being intact. In the one case I explored, it was found that only the nerve going to the *extensor communis digitorum* was involved, and that any interference with the main trunk would have done more harm than good. In three other cases under my care where this nerve was implicated, we have relied on electro-therapeutic measures with good results, voluntary power returning in most of the extensor muscles, leaving only one or two paralysed, which condition would be suitable for a tendon transplantation at a later date, if considered necessary.

(5) **Sciatic Nerve (8 cases).**—During the Somme offensive of July, 1916, I had four cases of complete division of the sciatic nerve in my wards at the same

time. All four were badly infected shell wounds of the back of the thigh, needing extensive incisions and prolonged drainage, which made any operative measures impossible till the following November. In all four the sciatic was completely divided, and in two cases a considerable length of nerve was completely destroyed, while the large amount of fibrous tissue formed as a result of the prolonged suppuration made the subsequent operation extremely difficult.

Case 9.—Private F., 16th D.L.I., was wounded on July 3, 1916, and was admitted to Epsom on July 7. There was a septic shell wound through the back of the right thigh. The femur was not injured. There was complete loss of power in all the muscles below the knee joint, with typical sciatic anaesthesia. The wounds were septic, and extensive adhesions with thorough drainage was necessary. The wounds being securely healed by the middle of October and all the muscles below the knee showing complete reaction of degeneration, the nerve was exposed on November 14. Complete division was found, the divided ends being enveloped in a mass of fibrous tissue as large as a pigeon's egg. After the bulbous ends had been removed, and end-to-end union without tension could only be performed by bending the knee at right angles, the leg was fixed in that position for three weeks and then very gradually straightened out.

The other cases were almost identical to the above, and were treated in exactly the same way. Sufficient time has not elapsed to say anything of the results in these cases.

(6) **Internal Popliteal (2 cases).**—The following case was of interest:—

Case 10.—Private B., N.F., was wounded on August 26, and was admitted to Epsom on August 31. There was a small wound at the back of the left thigh and X-rays disclosed a piece of shrapnel about the size of a sixpenny bit lying directly over the course of the sciatic nerve and a second tiny piece over the back of the mid-popliteal space. The patient complained of severe neuralgic pain referred to the area of distribution of the internal popliteal nerve, and some weakness in the corresponding muscles. Three weeks later the wound was well healed, and the electrical test showed no reaction of degeneration, but the pain persisted in the leg and was very severe at times. I first removed the larger piece of shrapnel and found this lying quite superficial to the main sciatic nerve and obviously not causing the trouble. A second incision was then made over the upper popliteal space. The internal popliteal nerve was identified, and on following it down a small swelling, the size of a pea, was found on the nerve. On opening this swelling a tiny jagged piece of shrapnel was removed. A small piece of Cargile tissue was wrapped round the damaged spot and the incision closed. The pain was at once relieved and had quite disappeared at the end of four weeks.

The presence of small pieces of shrapnel in a nerve trunk has not often been observed. In a recent number of the *Lancet*, an almost identical case was reported, and in September, 1915, my colleague, Captain F. Martin, when operating on a damaged external popliteal nerve at Harefield, removed a similar tiny fragment of shrapnel from that nerve with good result.

(7) **External Popliteal Nerve (6 cases).**—Injury to this nerve is frequently met with in war surgery, the cases all showing the typical inversion and foot-drop, which it is so important to rectify by a splint or specially adapted boot. The cases in question were all operated on by the methods laid down in this paper, and do not call for any special comment.

(8) **Facial Nerve (2 cases).**—

Case 11.—Private G., 10th Canadians, was wounded on June, 1915, by a bullet which passed through the base of

the skull in the region of the left mastoid process, completely destroying the internal ear and dividing the left facial nerve. After a long illness he recovered his general health and was left with total loss of hearing in his left ear and a complete left facial paralysis for which he was anxious to have something done. In November, 1915, the left facial nerve cut down upon and exposed up to its exit from the stylo-mastoid foramen. The nerve was then divided and the distal end anastomosed with an especially large branch of the spinal accessory supplying the sterno-mastoid. Nine months later the electrical report showed some improvement in the reaction of the face muscles, but no return of voluntary power. Two months ago, i.e., seventeen months after the operation, I received a letter from this soldier from Canada and a report from his hospital there, which told of a well marked return of voluntary power in all the left facial muscles and of returned faradic excitability.

The second case of facial nerve injury was that of a soldier with a bullet wound in the neck involving the facial nerve, just below the tip of the mastoid process. In this case, after much difficulty, I managed to dissect out the two ends of a much damaged and fibrosed nerve, and did an end-to-end anastomosis. In this case there was no evidence of any improvement when last heard of, twelve months after the operation.

ÆTILOGY OF GASTRIC AND DUODENAL ULCER.

By W. Spalding Laurie, M.D., B.S.
Physician to Out-Patients, Alfred Hospital, Melbourne.

The discussion on gastric and duodenal ulcer at the meeting of the Victorian Branch of the British Medical Association was exceedingly interesting, but was mainly surgical, and dealt principally with the operative methods adopted to patch up a damaged individual. When the named speakers had finished, it was too late to introduce new matter. But Mr. Devine made a suggestion that, in my opinion, was the most important suggestion concerning ætiology in the whole discussion. He drew attention to the patches of lymphoid engorgement in the stomach walls that are often seen by the surgeon, and suggested that they may have something to do with the incidence of ulcer.

We know that lymphoid overgrowth everywhere is liable to infective processes, and it seems to me that we here have the key to causation of gastric ulcer. I am a strong believer in unity of cause, and would therefore extend the suggestion to many other conditions. I do not believe that appendicitis and gastric ulcer are cause and effect, and the same belief applies to gall bladder infection, pyorrhœa and other conditions. We have been too ready to focus our attention on bacteriology to the exclusion of all else in the ætiology of disease. I remember the late Dr. John Williams, of Melbourne, in his teaching, insisting that the story of the tubercle bacillus was not the story of tuberculosis; and the story of the *bacillus typhosus* does not tell us the story of typhoid fever, nor the meningococcus that of meningitis. And if we are to accept the experiments of Rosenow in the conversion of pneumococci into streptococci and vice versa, surely we have paid too much attention to specificity, and have too much disregarded the probabilities of mutation. We have paid too much atten-

tion to the organisms and too little to the conditions which induce pathogenicity. We have been apt to regard lymphatic overgrowth and engorgement as the result of infection. Similar conditions can readily be produced in children and young people by improper diet, erring exactly in the same direction as that which renders children more susceptible and less resistant to infection. The functions of all organs are best maintained at a normal standard by being regularly called upon to perform their normal functions. Yet we begin almost at the beginning of life to pervert the functions of the infant's digestive organs. Teeth are given to the infant for the purpose of chewing, biting and tearing. Yet he is fed on pap food that does not call upon the teeth to perform these functions. It is only during the later months of infancy that the salivary function is fully established, yet carbohydrate food is considered the only proper diet. The gastric functions are established early to deal with the protein of the mother's milk. Yet when the infant gets beyond the stage of breast milk or cow's milk alone, it is thought proper to load him with stodgy stuff of vegetable origin, although we know that the digestive secretions can deal much less readily with vegetable protein and fat than with animal protein and fat. If we make any concession, it is to give broths and soups—a useless, and in some respects deleterious, concession.

For the past ten years I have been urging mothers to adopt a more rational diet for their children, and I have met with a large measure of success. Of course, it is inevitable that I should have made some mistakes in elaborating a dietetic scheme for which I had at first little guidance except my own observations. Lately, several Continental workers and Dr. H. C. Cameron, in England, have published observations that I have found very helpful.

If we are to prevent gastro-intestinal disease, including gastric and duodenal ulcers, appendicitis, gall-bladder infections and minimize the liability to enteric infections, we must insist throughout life, but particularly in the earlier years of life, upon a properly balanced diet, not excessive or deficient in any main constituent, and in such amount and form as to exercise each and every function perfectly.

Hyperchlorhydria may be a factor in gastric and duodenal ulcer, and so is infection, but both are, after all, only results of some kind of abuse of physiological function. Even in conditions like typhoid fever, where a portion of the intestine is inflamed and ulcerated, far better results are obtained by calling upon the digestive organs to exercise their normal functions by administering food than were formerly obtained by starvation treatment. It is now fifteen years since I, against all authority, began to feed typhoid patients, and I have never had occasion to regret it. Furthermore, children fed according to my methods do not suffer from the infantile types of gastro-enteritis during their second twelve months of life.

I have found the best treatment of gastric and duodenal ulceration, after the acute stage, with liability to haemorrhage, a solid diet, eliminating or at least restricting meat foods, prohibiting drinks with meals and restricting the total amount of liquid, insisting, of course, upon thorough mastication, and in some

cases giving alkalies. But we must recognize that, whether we treat these cases medically or surgically, we are merely patching up an injury, and we must therefore devote our energies to the prevention of conditions that I am sure are preventable.

Reports of Cases.

TWO CASES OF TRAUMATIC RUPTURE OF SPLEEN.

By R. M. CROOKSTON, M.B., B.S., Melb.
Camden, New South Wales.

The following two cases of a comparatively rare surgical accident may be of some interest.

Case I.—B. McK., *act. 11 years*, had been "doing Blondin" on a fence about 5 p.m. He fell, striking himself over the splenic area posteriorly, and walked home, a distance of about half a mile. At 9 p.m. I was sent for, the message being that he had "a pain in his stomach." The patient was very blanched, rather restless, and with a pulse-rate of 140, was showing a typical clinical picture of severe haemorrhage. The abdomen was distended, motionless on respiration, and dull practically all over. The site of the injury was marked by a slight recent bruise. As I was the only medical man in the town that night, I sent for Dr. Mawson, of Campbelltown, to give the anaesthetic, and had the patient ready on the table in hospital awaiting his arrival. The pulse-rate was still rising, and when the incision was made under very light anaesthesia, was about 160. The incision was made just to the left of the mid-line above the umbilicus; and an abdomen literally full of bright and dark blood presented. The spleen, fortunately, had a long pedicle, was easily brought to the surface, clamped and double ligatured off, and removed. The abdomen was rapidly closed with a through and through layer of silk-worm gut sutures, and the patient transferred to bed, where an intravenous saline injection was administered. The whole operation occupied about fifteen minutes; and recovery was uninterrupted. The patient left the hospital in a fortnight, apparently none the worse.

The spleen was of the usual size for a boy of his age, and showed an irregular tear into the hilum tissue, and several branch lacerations into the splenic pulp.

Since the removal there has been no interference with health or development in any particular. A blood examination four months after the operation showed nothing abnormal.

Case II.—L., *act. 20 years*, was injured by falling logs while carting. He was seen by Dr. Mawson, of Campbelltown, and transferred to hospital for observation. Consultative opinion was obtained as to the advisability of operation. No definite grounds for interference were detected. There was, I understand, considerable dulness on percussion at the left base posteriorly, and it was thought that there was some blood on the left pleura. About two days later, in the absence of the surgeon who had previously seen him, I was sent for. The nurse reported that he had suddenly collapsed after an enema. Examination showed the usual signs of extreme haemorrhage, which had obviously, from the history, occurred only about an hour or so before. His condition was desperate, and his pulse-rate 180. However, Dr. Mawson agreed to anaesthetize; and at the risk of further incurring bleeding, pituitrin 1 c.c.m. and saline were given while preparations were being made.

Being uncertain whether the bleeding was from the spleen or the liver, I made a mid-line incision above the umbilicus. The abdomen was full of blood, and the intestines were very distended. Diarrhoea had previously been very troublesome. The splenic region presented a large firm globular mass of blood-clot, about the size of a large citron, and embedded in this the spleen could be felt. This clot was partly removed, and the spleen felt to be lacerated. The pedicle was, however, very short, and a cross

incision had to be made for about 3.75 cm. (1½ inch) from the top of the original wound. The spleen was then brought up and rapidly removed. The incision was closed with one layer of silk-worm gut through and through sutures, and the patient put to bed. A saline injection was given.

In this case the patient's condition was so bad that several times during the operation a stop had to be made while we wondered whether he were just about to die on the table. However, he improved rapidly after he was returned to bed, and the pulse-rate settled down to about 100. The pulse was of moderately good quality, and we had hopes that recovery might be possible. About 20 hours after operation, however, things began to go badly. The pulse-rate and temperature rose, vomiting was very persistent, and there was violent delirium. A stab incision was made above the pubis for draining. Nothing but a little old blood appeared, and the patient died about 36 hours after operation. Whether in this case there was some complicating injury, or whether there was some condition of extreme toxæmia connected with the obscure diarrhoea, which was present before the operation, I am unable to say; and as the permission for a post-mortem examination was not obtained, the position must rest there.

The spleen was of normal size, and showed one large, irregular laceration passing deeply into the splenic pulp, and several smaller tears. There was no tear communicating with the hilum.

The interest of the case appears to me to lie in the manner in which first slow oozing, and two days later violent haemorrhage occurred. The mass of formed blood clot becoming adherent to the torn spleen had apparently given rise to dulness at the base, and for the time being had sealed the vessels. Intestinal disturbances, from the enema, or more likely from gradually increasing distension, disturbed the clot, and sudden overwhelming bleeding occurred. Taking into consideration the extensive laceration found after removal, it is difficult to see how violent bleeding did not occur at the time of injury. There was, however, at that time, no more than a suspicion of splenic injury, and the presence of broken ribs led naturally to the conclusion that the dulness at the left base was due to blood in the pleural cavity. The diarrhea was also a peculiar feature; and I was inclined to wonder whether the release of large amounts of the internal secretion of spleen may have accounted for this and for the final fatal toxæmia. There was no odour suggesting intestinal injury on opening the abdomen. Possibly a physiologist might express an opinion as to whether there may or may not be anything in the theory of the possible origin of the toxin.

Reviews.

MALINGERING.

In producing their conjoined work, "Malingering, or the Simulation of Disease,"¹ A. Bassett Jones and L. L. Llewellyn are supplying a contribution to literature that should be much appreciated by medical men, especially by those who examine claimants for pensions or accident compensation. Younger members of the profession who have taken up military work will find the information concerning shirkers and their little ways of great help in detecting fraud. In a very interesting introduction the authors trace malingering back to the earliest historical records, and discuss the aetiology of simulation, citing analogies in the habits of birds and animals. A great deal of their experience seems to have been gained in connexion with the English Workmen's Compensation Act, and a chapter is devoted to the task of discussing this Act as a factor in the alleged increase of malingering. All through the book there is an opinion frequently expressed that the younger, inexperienced

¹ Malingering, or the Simulation of Disease, by A. Bassett Jones, M.B., and Llewellyn, M.B., with a Chapter on Malingering in Relation to the Eye, by W. M. Beaumont, M.R.C.S.; 1917. London: William Heinemann; Royal 8vo., pp. 708, with 5 plates. Price, 25s. net.

practitioner is liable to credit many cases of genuine disorder with simulation, just as medical men of former days judged many cases of nervous disease which are now recognized as genuine, to be cases of malingering. The majority of those who practise malingering and simulation, are mentally or educationally below normal standard, and some extraordinary reasons for claiming compensation under the Insurance Act are mentioned, showing what a small amount of intelligence the average unskilled worker possesses. The authors mention several classifications and varieties of malingering, and compare the old-fashioned with the present-day ideas on the subject. They seem to regard pure malingering as rare, the majority of the cases met with being rather an exaggeration of a mild disorder, which forms the substratum of the complaint. The advice given in a long chapter on making a diagnosis of malingering may be summarized by saying that the medical man examining the case must have a sound knowledge of the disease simulated, tact and patience. Suggestions as to how the medical man should conduct himself in court, and how he should form his decision about a case are worth repeating. "The medical man, when he enters the contentious atmosphere of a court, must beware of being inoculated thereby and made a partisan . . . for often he would seem tempted to perform the function of an advocate, in spirit at any rate, and so we get the glut of that cross-swearin on the part of doctors which is most damaging to the self-esteem of a noble profession."

Simulation of diseases of the various systems is discussed very thoroughly. The diagnosis between malingering and hysteria is difficult, because in each there is no material substratum, and the ordinary tests for malingering cannot be applied to hysteria. In all cases undergoing examination the authors ask three questions: "Is it organic?" "Is it simulated?" "Is it hysteria?" and in the chapters dealing with the particular diseases which can be simulated, there are various useful tests suggested for the guidance of the examiner. In discussing the simulation of insanity, the authors do not lay sufficient emphasis on the difficulty which a medical man inexperienced in insanity would find in distinguishing the real from the assumed. Alienists claiming life-long association with the insane are sometimes unable to come to a decision in regard to the mental state of prisoners who plead insane. This section deserves more than the meagre 20 pages allotted to it. Nobody but an expert could examine a case of paranoia with any hope of success; consequently, in this and the sections dealing with the special senses, the practitioner should be advised to seek consultation with experts where possible. In the chapter on malingering in connexion with diseases of the eye, W. M. Beaumont has supplied an exhaustive series of tests for unmasking the malingerer. In examining the person simulating diseases of the special senses, the examiner has the individual at a disadvantage, owing to the latter's limited knowledge of these regions, whereas simulators who select the knee-joint or the spine as the locality of their complaint, have often learned some of the symptoms of those diseases from past attendance at a hospital. Numerous devices for producing the appearance of disease are mentioned. The ingestion of picric acid will produce the appearance of jaundice, the injection of petrol, paraffin, or turpentine will produce abscess; condensed milk introduced into the urethra simulates gonorrhoea; stools, urine, and sputum are bought and sold; urines are "faked" to resemble albuminuria and glycosuria by the addition of egg white and glucose. The eating of cordite, to produce irregular heart action, is not mentioned, although this was common in the South African War. There are two chapters in which accidents and suggestions for the restriction of malingering are discussed. The authors appear to have a thorough inside knowledge of the attitude of the claimant to the company and the company to the claimant, and they point out the weak spots in the Act as it now stands. They draw attention to the injustice of some of the conditions of the Act, and suggest alterations which they think will benefit both the company and the client. It is disappointing to find the index so deficient. A book of this size and character is twice as valuable if it is well indexed. The inclusion of a chapter on malingering in the Army and Navy, based on experiences during this war, would add considerably to the value of this work.

Public Health.

NEW SOUTH WALES.

The following notifications have been received by the Department of Public Health, New South Wales, during the week ending October 27, 1917:—

	Metropolitan		Hunter River		Rest of		Total.
	Combined District.	Combined District.	District.	State.	Os. Dths.	Os. Dths.	
Enteric Fever	5	0	1	0	2	1	8 1
Scarlatina	14	0	1	0	7	0	22 0
Diphtheria	25	0	1	0	29	1	55 1
C'bro-Spl. Meningitis	1	1	0	0	0	0	1 1

*Notifiable only in the Metropolitan and Hunter River Districts, and since October 2, 1916, in the Blue Mountain Shire and Katoomba Municipality.

SOUTH AUSTRALIA.

The following notifications have been received by the Central Board of Health, Adelaide, during the week ending October 20, 1917:—

	Adelaide.		Rest of		Totals.
	Ca. Dths.	Os. Dths.	Ca. Dths.	Os. Dths.	
Diphtheria	5	0	20	0	25 0
Pulmonary Tuberculosis	5	0	8	4	13 4
Pertussis	0	0	5	1	5 1
Morbilli	0	0	5	0	5 0
Scarlatina	2	0	1	0	3 0
Enteric Fever	1	0	2	0	3 0
Erysipelas	1	0	2	0	3 0
Favus	0	0	4	0	4 0
C'bro-spinal Meningitis	0	0	2	0	2 0

VICTORIA.

The following notifications have been received by the Department of Public Health, Victoria, during the week ending October 28, 1917:—

	Metropoli-		Rest of		Total.
	Ca. Dths.	Os. Dths.	Ca. Dths.	Os. Dths.	
Diphtheria	47	3	30	0	77 3
Scarlatina	45	1	16	0	61 1
Enteric Fever	2	0	2	0	4 0
Pulmonary Tuberculosis	37	3	8	8	45 11
C'bro-spinal Meningitis	1	—	0	—	1 —

QUEENSLAND.

The following notifications have been received by the Department of Public Health, Queensland, during the week ending October 27, 1917:—

Disease.	No. of Cases			
	Hobart.	Launce-	Country:	Whole
Cases.	ton.	Cases.	Cases.	Cases.
Diphtheria	4	4	8	16
Pulmonary Tuberculosis	1	1	2	4
Puerperal Fever	1	0	0	1
Dysentery	—	—	—	1
Malaria	—	—	—	2
Ankylostomiasis	—	—	—	1

TASMANIA.

The following notifications have been received by the Department of Public Health, Tasmania, during the week ending October 27, 1917:—

Disease.	No. of Cases			
	Hobart.	Laun-	Country:	Whole
Cases.	ton.	Cases.	Cases.	Cases.
Diphtheria	4	4	8	16
Pulmonary Tuberculosis	1	1	2	4
Puerperal Fever	1	0	0	1
C'bro-spinal Meningitis	0	0	1	1

The Medical Journal of Australia.

SATURDAY, NOVEMBER 10, 1917.

Professional Re-Education.

In May of this year a highly important conference—*Conférence interalliée pour L'Etude de la Re-éducation professionnelle et des Questions qui intéressent les Invalides de la Guerre*—took place in Paris. Reference to this conference has been made in this journal, and especially in connexion with the publication, *Recalled to Life*. At this conference there were several distinct sections. The first was devoted to the consideration of the physical treatment and functional restitution of disabled men. The second dealt with professional re-education. Both subjects concern the medical profession. While the whole task of carrying out physical treatment is of necessity entrusted to medical men, the training of the man to a new occupation or the re-training to his old calling, has a distinct medical bearing. In view of the vast number of maimed men who are now unfit for further military service, it is evident that the medical profession will be required to pay more attention to orthopaedic treatment and to equip itself to meet this public demand. When the medical officers at the Hammersmith Hospital were asked to make a return of all the men requiring orthopaedic treatment, as a preliminary to the organization of the special centres in Great Britain, the name of every patient, save those who were suspected of malingering, was sent in. Not every badly wounded soldier will have to be retaught a trade or calling, but there will be many who, without some form of special training of a professional character, will be unable to command a living wage. The conference in Paris determined that professional re-education should be kept distinct from physical treatment. Manual work is employed as a therapeutic measure and is immeasurably superior to purposeless, mechanical exercises. As long as this work is required for the purpose of restoring the impaired functions or of saving what can be saved of the muscular utility of a man, no actual training, having for its purpose

the acquisition of a calling, should be undertaken. This, however, does not imply that the fact that the man will require to be equipped for a useful life later, may be lost sight of. It remains a part of the duty of medical officers having charge of the men undergoing treatment, to mould the treatment to the ultimate requirements of the patient. Long before the man has finished his physical treatment, it will be possible to determine what occupation he will be able to follow. His interest must be sought at an early date, in order that on his discharge from treatment, he will be inclined to submit to re-education. Throughout the British Empire, there is to be no compulsion, either in regard to treatment or in regard to re-education. Every means should be employed to persuade the patient to demand as complete restitution as his condition admits, and to avail himself of the facilities provided for utilizing his powers to re-establish himself as a useful, self-supporting citizen. There is first of all the choice of calling. In this, the medical man should be prepared to act as guide and friend. Next, after the selection has been made, the physical treatment and training may be adapted in such a way, that special manual work may lead to the development or re-awakening of those muscles peculiarly required for the calling. The third concern of the medical man in this connexion is in the accomplishment of the re-education. This task may be difficult. It requires judgement and diplomacy. The professional re-education must be directed by experts in the calling selected. The medical aid can only be of use, if it remain auxiliary and advisory. By keeping in close touch with the man, after his physical treatment is over, the medical man may expedite the training by judicious suggestion, and will certainly learn important lessons, which he may apply in the case of others, who may undergo a similar course of treatment and subsequent training. Professional re-education is the final phase in the orthopaedic system. It is too important to be neglected.

A LEGAL DEFINITION.

On October 16, 1917, the Honourable C. F. Marks moved in Committee of the Legislative Council of Queensland that Clause 2 of the Opticians Bill, which

deals with interpretations, be amended. The paragraph under discussion is as follows:—

"Certified optician"—A person who is the holder of a certificate in force issued under subsection one of section twenty-one of this Act entitling him to practise optometry.

The suggestion of Dr. Marks was to alter this paragraph to read:—

"Certified optician"—A person who is the holder of a certificate in force issued under subsection one of section twenty-one of this Act entitling him to grind lenses of all varieties, to dispense oculists' prescriptions, and to sell spectacles.

The Honourable Alfred James Jones, the Minister for Mines, opposed the amendment on the ground that, if passed, it would render the bill practically worthless. Two members supported the amendment; the rest followed the lead of the Minister for Mines. One of the supporters in debate failed to register his vote and, consequently, on the division, the amendment had but two supporters. This sealed the fate of the measure. Sundry other amendments were discussed; some were agreed to; others were refused. The Minister, by opposing the vital amendment to Clause 2, and the members who took the same view, will now have to bear the whole responsibility of this highly dangerous and mischievous measure. Sooner or later it will come to the knowledge of the Ministry that persons have lost their sight or have died of a curable disease, because the conditions from which they were suffering were not detected by the "certified opticians," to whom the Government has given its hall mark. The public will naturally regard the certification as an indication that the holders are competent to diagnose affections of the eye and to distinguish them from errors of refraction which require lenses for their correction. There is no excuse of ignorance in this connexion, for the various Ministers, and indeed all the members of both Houses, have been informed of the facts and have been placed in possession of the considered opinion of the most prominent ophthalmologists in the British Empire. Nor is there a valid excuse for its introduction to protect those living in the out-back districts where no oculist is within reach and where perhaps the nearest doctor is

far away. It can afford them no protection at all. In the absence of any enactment, people can consult an optician, when they suspect that there is something wrong with their eyes, but they do so at their own risk. If a wrong diagnosis be made, or if the lenses supplied be not suitable for the particular case, at all events the Government would not be responsible for the harm done. Under the old condition of affairs the patient is foolish if he trusts to a person who has no physiological training, to remedy an assumed defect in a highly sensitive organ. Under the new law the Government is responsible for all the harm that will certainly be done, unwittingly and in all good faith, by opticians attempting something they are quite unfitted by education and special training to carry out properly, and safely.

The Legislative Council has thrown an onus on the Governor which no man can support. As the medical profession has determined to have nothing to do with this measure, and has refused to accept seats on the Board of Optical Registration, Clause 4, sub-clause (2) has been amended by the addition of the words:—

Provided that, if no suitable medical practitioner is willing to act as a member of the board, the Governor-in-Council may appoint as the fifth member of the board a person deemed by him to be a competent optician.

An optician, namely, a person trained to grind lenses and to dispense prescriptions of trained oculists, cannot possibly be regarded as competent to "practise optometry," which we presume means to test sight and to distinguish between errors of refraction and ocular or bodily diseases. The board will, therefore, comprise three certified opticians elected by the certified opticians and one elected by the Governor in Council. The blind leading the blind; and incidentally having the power to disseminate blindness throughout the community! It is inconceivable to us how any legislative body, no matter how unsympathetic it may be toward the medical profession, could, with deliberation and after long warning, assent to so dangerous a measure as the Opticians Bill. And yet this Bill was read a third time in the Council on October 18, and was referred to Committee by the Legislative Assembly on October 18, 1917.

VITAL FORCE.

The doctrine of a vital force endowing the living tissues with properties additional to those conferred upon them by the physical basis and chemical constitution of the living matter, still predominates in many physiological conceptions. In his recent work¹ on the secretion of the urine, Professor A. Cushny says that the advances in physical chemistry have shown that the known physical forces are inadequate to form from blood plasma a fluid of greater osmotic pressure. Without invoking the vital activity of the epithelium of the uriniferous tubules it seems impossible to account for the composition of the excreted urine. The kidney, in common with the rest of the body, is built up from the amino-acids, glucose, fatty acids, inorganic salts and water which have been supplied to its growing cells for nutriment. Whatever properties may be conferred on the material built up by combining these substances together or by arranging the formed material into any particular morphological structure, such properties are of the same nature as those present in the inanimate substances from which these cellular components are formed. To call these properties vital seems to be a misnomer. On the other hand, these substances are built up by the living cells which form the foundation of the kidney. These cells may be supposed to confer some vital power on their descendants, though it is difficult to conceive them altering the chemical and physical properties of the compounds used to make the cells. The living cell is, however, characterized by the capacity to produce enzymes, but these ferments behave similarly to inorganic catalysts. In this way a cell may be regarded as provided with vital force.

Where so little is known, it is futile to object to the postulation of some vital force enabling the uriniferous tubule to raise the concentration of some constituents of the urine to many times their proportion in the blood. It should, however, be remembered that physiological progress has repeatedly limited the domain in which vital force may operate. At one time it was believed that the substances of which the animal and vegetable tissues are composed, required a vital force for their formation. Gmelin, in his monumental handbook, stated that the difference between organic and inorganic bodies consisted in the fact that inorganic substances could be prepared artificially from their elements, while the organic substances would not be so made. Berzelius wrote in his celebrated treatise that, in living nature, the elements appeared to obey different laws from those in inorganic nature, and that the elements differed from those with which inorganic nature presented us. When Wöhler succeeded in making urea by boiling an aleoholic solution of ammonium cyanate and in preparing a substance typically organic from purely inorganic material, discerning minds recognized that no vital force was necessary for the manufacture of organic compounds. Since this discovery in 1828 the number of substances found in the animal and vegetable kingdoms which have been prepared artificially, has so increased that

no one can doubt that it is only a question of time before all have been synthetized. Indigo was made by Baeyer, oil of mustard by Tollens. Taurine, salicin, piperidine, tyrosine and vanillin followed as the decades passed by. Fructose and other sugars, polypeptides, uric acid and the purin bases have been manufactured in recent times through the skill and patience of the organic chemist. While there remain a few who still believe that natural products may have medicinal powers that are not possessed by the artificially made substances, most observers are convinced that any differences that may exist, are due to impurities mixed with one or other drug.

CHOLERA IMMUNITY.

There are many problems in immunity which await study and solution. Among those of great practical importance may be cited the relation of immunity to the carrier state. It is evident that if a person becomes a cholera or typhoid carrier after an attack of one of these diseases, his immunity is of a peculiar nature, since it does not involve an inhibition to the growth of the pathogenic bacterium. That the immunity exists is demonstrated by the fact that the disease came to an end spontaneously, and further, that, notwithstanding the persistence of the bacteria within the body, no further disease manifestations appear. This form of immunity is all the more difficult to understand, in view of the fact that in neither enteric fever nor cholera is a true toxin produced. It is usually held that the manifestations of the disease result from the absorption of endotoxins, that is of the disintegrated bacterial bodies or their protein content. It is therefore reasonable to assume that an antibody active to the specific protein of the bacterium is present. It may be that the immunity is analogous to the condition of anti-anaphylaxis, but in this event, it would probably not be so persistent and stable as is the protection against a second attack of enteric fever. Otto Schöbl and C. S. Panganiban have made some interesting experiments on rabbits and guinea-pigs, with the object of extending our knowledge on this subject.¹ They confirmed Viole's findings that immunity, as evidenced by the agglutination phenomenon, follows on the experimental production of the carrier state. Animals were inoculated with cholera vibrios into the gall-bladder. Their blood rapidly gained the power of agglutinating cholera vibrios. In the next place they immunized a rabbit with killed vibrios and then tested the agglutinating power of its serum. It was very high. On the other hand, the immunization did not give rise to agglutinins in the bile. When an immunized rabbit was infected into its gall-bladder, the bile gained some agglutinating power. Guinea-pigs immunized from 8 to 19 days before infection into the gall-bladder were found within 14 days to be harbouring vibrios in the bile, duodenum, ileum and caecum. Similarly, guinea-pigs infected into the gall-bladder and subsequently treated with killed vibrios, harboured as many vibrios in the gall-bladder and intestines as untreated animals. The outcome of this research is,

¹ The Secretion of Urine, London, 1917.

¹ The Philippine Journal of Science, B. Tropical Medicine, March, 1917.

therefore, that treatment before or after the production of the carrier state with vibrios killed by heat, does not influence the duration or intensity of the carrier state. This finding coincides with clinical experience. The explanation of the immunity is, consequently, still lacking.

THE DISCOVERY OF CHLOROFORM.

It frequently happens that discoveries in science are made more or less simultaneously by two or more workers in different parts of the world. When the investigations have proceeded for some time and the individual workers have been unaware of the fact that others were engaged in the same researches, the result has usually been a struggle for priority. That this should be so is, after all, but natural, but it is nevertheless regrettable that the world should not be satisfied to recognize the efforts of two or more workers who have been successful in solving the problem they set themselves. In the *Transactions of the New York Academy of Sciences* of June 6, 1892, there is an interesting article by Oliver P. Hubbard and a short report by a committee appointed by the members of the Chicago Medical Society, both dealing with the priority in the discovery of chloroform. It appears that Liebig published in his *Annalen*, under date of November, 1831, the fact of his discovery of chloroform. When the actual preparation of the substance was first effected is unknown. Soubeiran published in the October (1831) number of *Les Annales de Chemie et de Physique* that he had discovered chloroform (*éther bichlorique*). According to Liebig this issue did not appear until January, 1832. It is said to contain a meteorological report for the whole of the month of October. It is, however, not clear from these facts which of these two chemists completed his researches and prepared his report for publication first. Guthrie published an article in Silliman's *American Journal of Science and Art* of January, 1832, an article bearing the date September 12, 1831. In the same journal of October, 1831, Guthrie published an undated article, in which he stated that a great number of persons had drunk of his solution of chloric ether during the previous six months. It is, of course, possible that Guthrie may have completed his discovery earlier than Liebig or Soubeiran, but there is certainly no direct evidence that this is so. The committee referred to above, found that "Dr. Samuel Guthrie is justly entitled to the honour" of having first discovered chloroform. In the absence of the exact dates on which Liebig, Soubeiran and Guthrie sent in their articles for publication to the respective journals in which these articles were eventually published, it is unsafe to form a definite conclusion as to who was the first of the three independent discoverers of chloroform. The world is under a profound debt to all three.

AUSTRALIAN ARMY MEDICAL CORPS COMFORTS FUND.

During the past week we have received four contributions. The total now stands at £99. It has taken us five months

to collect the first £100. For so good a cause we venture to hope that by Christmas another £50 will come in.

	£ s. d.
Amount previously acknowledged . . .	89 11 0
Dr. F. C. Stevenson (Moss Vale, N.S.W.)	2 2 0
Dr. W. R. Groves (Kyneton, Victoria)	2 2 0
Dr. R. W. H. Maffey (Singleton, N.S.W.)	3 3 0
"Country Practitioner"	2 2 0

We note with regret that Dr. A. Jarvie Hood's name has been incorrectly printed in our issue of last week.

Hospitals.

ROYAL PRINCE ALFRED HOSPITAL.

The Annual Report of the Royal Prince Alfred Hospital, which was submitted to an Annual General Meeting on April 11, 1917, together with various addenda, has been published in book form, and covers 226 pages of print.

In-Door Patients.

During the course of the year 1916 6,330 patients were admitted to the Hospital. In addition to these patients, there were 373 still under treatment on January 1, 1916, while on December 31, 1916, there were 352 who were not well enough to be discharged. The total number of deaths during the year was 398, and consequently the mortality was 6.27%. It is stated that 83 of the patients died within 24 hours of admission. Excluding these, the mortality would be 5.03%. The Directors give the rate of mortality on the basis of the total number of patients under treatment as 4.70%. In view of the fact that some of the 352 patients still under treatment at the end of the year may have died since, this method of calculating the general mortality is not admissible. The total number of those discharged was 5,953. Of these, 3,936 were said to have been cured, 1,615 to have been relieved, and 402 to have been unrelieved. The average length of stay in the Hospital was 23.45 days per patient, and the average number of patients in the Hospital on any given day was 392.6. The total number of available beds in the Hospital was 410.

Of the 630 patients admitted during the year, 3,653 were attended free of charge, while 2,677 contributed in the aggregate £6,511 8s. 9d., which is equal to just over £2 ss. 0½d. per patient. On the assumption that the average length of stay was the same for the paying patients as for the total number, each paying patient contributed 2s. 0½d. per day towards his maintenance. The daily maintenance of each patient costs approximately 6s. 5d., so that the contribution may be regarded as about one-third of the cost of maintenance. The patients brought to the Hospital for treatment of the results of accident, or in emergency, were admitted without further question. Otherwise, an investigation into the financial position of the patients is made. The number of patients sent into the wards from the Out-patient Department was 1,096.

It is pointed out that the average stay of patients was increased, as compared with the previous years. This was rendered necessary by the admission of children and others suffering from venereal disease, as well as by the large number of patients under treatment for epidemic cerebro-spinal meningitis. An arrangement was made with the Government whereby the number of beds for females and children suffering from venereal disease should be increased by ten. In addition to this extension, a new gynaecological ward, containing ten beds, was opened during the course of the year to meet an urgent demand. In this way, the number of available beds was increased from 385 to 410.

Out-Door Patients.

The amount of work accomplished in the Out-patients' and Casualty Departments was very considerable. During the course of the year 35,630 persons received treatment, as compared with 34,648 in 1915. In a similar manner, the operative activity of the surgeons was expanded. No less than 5,258 operations were performed. This number is 639 in excess of the number of operations performed in 1915. While in 1915 65.4% of those admitted to the Hospital were subjected to operation, in 1916 the percentage was raised to 78.44.

The Directors call attention to the insufficiency of the accommodation, and to the urgent necessity of placing 10

additional beds at the disposal of the sick poor. The Minister of Health asked for information in regard to the cost of maintaining these beds. This information was supplied, but unfortunately no action has been taken by the Government.

Special Departments.

Among the special departments, that devoted to the treatment of persons suffering from venereal disease has attracted the greatest amount of attention. In 1915 the Board decided to limit the number of patients under treatment at any given time to 500. This rule was respected for a time, but was allowed to lapse during the course of the year under review, and at one period there were nearly 800 persons receiving treatment. The strain placed upon the staff was very great, and the Board held the view that the wide extension of the department was affecting the character of the institution as a general hospital. It was therefore decided to reduce the number of patients under treatment to 400, and subsequently this number was still further diminished. The regulation was therefore amended, so that not more than 200 persons should be under treatment at any one time.

In the Anti-tuberculosis Dispensary 371 new patients were dealt with. The Medical Superintendent states that the work of this Department is largely diagnostic, and that in suitable cases the patients are sent, whenever it is possible, to a sanatorium. It appears that persons suffering from advanced pulmonary tuberculosis are admitted into the general wards of the Hospital, when accommodation can be found. The Medical Superintendent holds the view that accommodation should be provided in the projected isolation block.

In the Pathological Department, the installation of an electrically-driven centrifuge, and of other mechanical apparatus, has enabled the staff to deal with the ordinary routine work without assistance from outside. It is stated that the Wassermann reaction was carried out in the Department, instead of elsewhere. There were over 9,000 investigations and 247 post-mortem examinations.

In the X-ray Department a very considerable increase of work is recorded. The Superintendent states that new apparatus is required in order to bring the Department thoroughly up-to-date. He deplores, however, that the installation would cost at least £1,000.

Medical Staff.

In 1914 the Board determined that no new appointments to the honorary staff should be made during the currency of the war. An exception was rendered necessary by the creation of the special department for venereal diseases. In all other instances the necessary appointments have been of a temporary character. During the year 1916 Dr. A. E. Mills, Dr. R. Gordon Craig, Dr. John Morton and Dr. Herschel Harris returned from active service abroad and resumed their duties at the Hospital. Dr. C. Bickerton Blackburn obtained leave of absence, to enable him to proceed to the front, in charge of the 14th Australian General Hospital. In view of the continued absence of several members of the honorary staff, the Board of Directors considered the question as to how far the services of members of the honorary consulting staff could be utilized in the active work of the Hospital. This matter has been referred to the Medical Board. Various temporary expedients have been adopted to meet the difficulties caused by the shortage of resident medical officers.

During the course of the year, Dr. H. J. Clayton was released from military service abroad and enabled to resume his duties as Medical Superintendent. The Directors record their appreciation of the manner in which Dr. L. G. Teece had carried out the duties during Dr. Clayton's absence.

Nursing Staff.

The Directors record their satisfaction at the way in which the nursing staff carried out the duties, and particularly thank the Matron for her excellent work, conducted under very trying circumstances. The strain was not quite so great as in the previous year, owing to the fact that fewer senior nurses were required to take up military duty, and consequently the number of nurses who had attained the rank of Sister was larger than in 1915.

Administration and Finance.

In dealing with the administration of the Hospital, reference is made to the resignation of the Honourable

H. E. Kater from the office of Honorary Treasurer. The Directors place on record their regret that Mr. Kater should have been forced to relinquish his duties on account of ill-health, and their very high appreciation of the services he had rendered for 14 years. Mr. Samuel Hordern was elected to the vacant office.

The financial position of the Hospital has given the Treasurer and Directors considerable anxiety during the course of the year. The Government subsidy amounted to £35,108, and included a special subsidy of £14,708, a bed subsidy of £11,700, an ordinary subsidy of £4,750, a subsidy for the Venereal Diseases Department of £1,700, a special grant of £1,750, and a grant towards the maintenance of the Anti-tuberculosis Dispensary of £500. The grant in respect of the treatment of venereal diseases was increased from £500, which was paid in 1915. The special grant was provided for the purpose of discharging the extra payments in salaries. A new industrial agreement with the Hospital and Asylum Employees' Union came into force on June 30, 1916. A minimum wage was fixed at £2 15s. 6d. for male adults, which represented an increase of 10s. 6d. per week. The Government regarded the application for financial assistance, for the purpose of meeting this additional expenditure, with favour, but towards the end of the year intimated to the Directors that the special subsidy, which was formerly £15,000, would be reduced to £11,500. Eventually, a compromise was effected, and the Directors were compelled to make the best of a subsidy which was £1,000 less than the amount they had previously received. The income from public contributions was approximately £1,500 more than in the previous year; the greater part of this increase was due to the increased contribution from the Hospital Saturday Fund. There was similarly an increase in the contributions from patients. The total income amounted to £22,252, while the expenditure was £772 more. It is unnecessary to enumerate the various articles that have become more expensive during the course of the year. It would appear from the figures published that reasonable economy was exercised, having regard to the quality and quantity of the work achieved.

A considerable amount of information is included in the statistical records. This material, however, does not lend itself readily to summarized reproduction, and, as we have pointed out on many occasions, can only be used with reservation and under special circumstances for the purpose of ascertaining case mortalities and the curability of disease.

Vital Statistics.

SOUTH AUSTRALIA.

The returns for August, 1917, of the births and deaths registered in South Australia contain the following information. There were 1,041 births, which is equivalent to an annual birth-rate of 24.48 per 1,000 of population. This rate is lower than that registered in August since the year 1912. The highest rate was in 1914, when it was equivalent to an annual rate of 32.16.

The number of deaths totalled 328, including 57 of infants under one year of age. The death-rate was equivalent to an annual death-rate of 10.68. In August, 1912 and 1913, it was 10.8; in August, 1914, it was 10.08; in August, 1915, it was 10.26; and in August, 1916, it was 12.96. The infantile mortality was 53.1 per 1,000 births.

Diseases of the cardio-vascular system caused 69 deaths, tuberculosis caused 30, pneumonia 18, diphtheria 11, enteric fever two, diarrhoea and enteritis two, erysipelas two, tetanus two, meningitis two and influenza two. There was one death from pertussis, one from non-puerperal septicaemia and one from puerperal. Puerperal septicaemia caused three deaths. There were 31 deaths from cancer, 11 from diabetes and one from leukaemia.

The number of births registered in the city of Adelaide was 92, which is equivalent to an annual birth-rate of 27.84. The number of deaths registered in the city was 79, but only 57 of these were of persons usually resident in the city. The corrected birth-rate was, therefore, equivalent to an annual rate of 17.28.

Abstracts from Current Medical Literature.

PATHOLOGY.

(163) Periarteritis Nodosa.

O. Klotz has described the clinical histories, appearances upon autopsy, microscopical anatomy and bacteriology of two cases of *periarteritis nodosa*, a rare disease of man and animals (*Journ. Med. Research*, September, 1917). Records of the histories of forty patients who have suffered from this disease, have been found in medical literature. The first patient in this series was a woman aged 33 years, who was habitually constipated. After being chilled in a rain-storm she experienced severe pains in the muscles and joints as well as in the region of the stomach. Vomiting occurred intermittently. This condition lasted three weeks. The temperature varied from 37° C. to 39° C. without remissions. Tenderness in the right upper quadrant of the abdomen and slight icterus suggested acute cholecystitis. Swelling of the left elbow preceded death, which occurred suddenly. At autopsy the liver showed a diffuse subcapsular haemorrhage extending from the costal margin to the diaphragm. The liver tissue was soft and contained numerous small localized haemorrhages. The hepatic artery showed a scarred and corrugated wall. The other organs were more or less healthy. Microscopically the portal systems showed all grades of non-suppurative inflammation. The inflammatory process begins in the outer part of the artery and is accompanied by a hyaline degeneration of the media. The intima only becomes involved secondarily to the changes in the outer coats. Thrombosis of the involved arteries follow. Secondary aneurysms may form. Rupture of these aneurysms gives rise to the haemorrhages. The second patient was a man aged 53 years, who had suffered from dyspnoea for two years. He complained of general weakness and nycturia. Cyanosis was present and the liver enlarged. The patient died about one month after admission to hospital. The liver showed at autopsy the same general appearance as previously described. The liver was, however, surrounded by fluid and clotted blood, and two litres of blood had escaped into the abdominal cavity. This patient reacted to the test of Wassermann. The bacteriological examination yielded streptococci in the cultures made from the livers. Growths from these cultures have been injected into rabbits, which developed in some cases periarteritis along the hepatic artery.

(164) Phagocytosis in Vitro.

C. J. Bartlett and Y. Ozaki have studied the conditions of phagocytosis in rabbits injected intravenously with cultures of *Micrococcus aureus* (*Journ. Med. Research*, September, 1917). The

growth of bacteria was suspended in saline solution and introduced into the vein of a rabbit's ear. Ten minutes later the animal was killed by a blow. Smears were made from the blood of the heart, and sections were made from various organs. The lungs, spleen and liver were used to ascertain the conditions under which the micrococci were taken up by the cells of these tissues. In studying these organs determinations were made of the numbers of bacteria fixed in the cells of the organ, the number in leucocytes and the number free in each field of the microscope. When sufficient experiments had been done to ascertain the usual distribution in the healthy rabbit, experiments were conducted under various abnormal conditions. Fasting did not cause any pronounced change. Chloroform anaesthesia and acute phosphorus poisoning diminished the phagocytic ingestion of the micrococci by the cells of the liver, spleen and lungs, though the phagocytosis by the leucocytes did not appear to have undergone any deviation from that in healthy animals. The absence of any diminution in the phagocytosis *in vivo* during chloroform anaesthesia is in contrast to the effect on the opsonic index, which is reduced during anaesthesia by chloroform and ether. During acute general infection after a large dose of *Micrococcus aureus*, phagocytosis by the leucocytes is reduced during the advanced stages of the infection. The bacteria introduced into the circulation are chiefly detained in the liver and spleen. This power of taking up microorganisms is lost when the tissues of the organs undergo degeneration.

(165) Cultivation of Typhoid and Paratyphoid Bacilli.

P. Pagniez and P. Vallery-Radot have grown typhoid and paratyphoid germs upon human serum (*C.R. Soc. Biol., Paris*, February, 1917). On heated normal human serum these bacilli grow as well as on animal sera. Subcultures can be made for many generations. The colonies are similar in appearance to those on agar, but are less numerous. On heated serum from persons vaccinated against enteric fever or from patients suffering from fevers due to typhoid or paratyphoid organisms, the bacilli grow as well as on normal serum. After prolonged subculture, the bacilli retain their usual differential characters on different media and they agglutinate with their specific antisera after cultivation on broth for one generation. The microorganisms grow equally well on sera heated to 56° C. or to 48° C. On normal human serum, or on sera from patients suffering from enteric fever or paratyphoid fevers, which have not been heated, variable results have been obtained. Sometimes the bacilli grow well for one or two generations and then die out. At other times the bacilli do not grow at all. The addition of a small amount of broth to the sera makes the liquid a good medium for the culture of these microbes.

(166) Cultivation of Spirochaetae Icterohaemorrhagia.

L. Martin, A. Pettit and A. Vaudremer have succeeded in growing the spirochaete causing haemorrhagic jaundice on fluid media (*C.R. Soc. Biol., Paris*, February, 1917). Attempts to obtain growth on solid media have failed. Growth has been obtained in ox serum diluted with ten volumes of 0.85% sodium chloride. After inoculation with blood from the heart or with liver pulp from infected animals, a layer of vaseline is placed on the surface of the liquid. The optimal temperature for incubation is 23° C. Subcultures have been made for six generations. The spirochaetes retain their virulence. Better results have been noted with rabbit's serum diluted six times with 0.85% sodium chloride. On the sixth day, 70 to 80 spirochaetes are found in each field of the microscope on examining a drop of the fluid. The spirochaetes grow in ox serum diluted 10 times with Locke's fluid at 33° C.. The sub-cultures in this medium, however, die out on the second or third sowing. The spirochaetes are similar to those seen in the liver of infected guinea-pigs. They produce haemorrhagic jaundice on inoculation into guinea-pigs. The spirochaetes in the cultures can be stained by any of the usual methods for staining flagellate organisms. Plates are given of the spirochaetes stained by a silver impregnation.

(167) Hepatic Lesions in Bacillary Dysentery.

K. Lancelin has examined the livers in seven out of eight fatal cases of bacillary dysentery in soldiers during an epidemic at Brest (*C.R. Soc. Biol., Paris*, February, 1917). The liver is usually enlarged and congested. Its tissue is soft and sometimes friable. On microscopical examination the lobules were observed to have undergone little change in the centres, while the periphery showed trabecular and cellular changes, fatty infiltration and periportal fibrosis. The cells were swollen with granular protoplasm. Fatty globules were present. The nuclei stain badly. The blood-vessels were altered, and showed signs of phlebitis. The biliary canals appeared unaltered. As the bacilli do not enter the blood in bacillary dysentery, it has been supposed that the germs ascend the biliary passages. In these livers the whole of the biliary passages exhibited no abnormal appearances.

PÄDIATRICS.

(168) Internal Hydrocephalus.

Schlapp and Jere (*Amer. Journ. of Dis. of Children*, June, 1917) report in detail the results of clinical, post-mortem and histological investigations in eight cases of internal hydrocephalus of the obstructive type, bringing special emphasis to bear on the obliterating lesion of the aqueduct of Sylvius as a

cause of ventricular distension. Their summary is as follows: In many, if not in the majority, of cases of the congenital form of internal hydrocephalus, the disease is the result of closure of the aqueduct of Sylvius through proliferation of the glia and ependymal tissues, or of invasion of the fourth ventricle by tumours having their origin in the floor, the choroid plexus or the membranous roof of the ventricle. Those cases also, developing acutely in previously healthy adults and older children, and having the same pathological changes, may have been brought about in the same manner, namely, through the stimulation by some chemical poisoning of a tissue which is embryologically defective. These cases differ, no doubt, aetiologically from that large group, following meningitis, the acute infectious diseases, and those due to bacterial invasion of the brain substance and ependyma from extension of suppurative processes of the middle ear or cells of the mastoid, frontal and ethmoid bones. A consideration of the life processes of the cell offers an explanation of the occurrence of many cases of congenital and acquired closure of the Sylvian aqueduct. Metabolism is nowhere more delicately expressed than in the highly complex chemical reactions of the cells of the central nervous system; and while knowledge of these reactions is still far from complete, it is, nevertheless, conceivable that any slight noxious influence may be sufficient seriously to disturb the latent forces of the glia cells, resulting in the dominating influence of one or another of the processes, residing in these cells. These life processes may be divided into the nutritive, the formative and the functional activities. In the first, which involves an appropriation of nutritive substances from the blood, potential energy is stored up and is subsequently translated into formative or functional activity, as represented by cell division on the one hand, or by functionation of the specialized cell on the other. In cells which have become highly specialized as the nerve cell, gland cell and muscle cell, the potential energy of the cell body is converted into the predominating activity, and the formative process is held in abeyance, and, as long as the normal relation between synthesis and katalysis is maintained, functional activity of the cell remains in a state of constancy. On the other hand, in those cells not highly specialized, as the ependymal, glial and the connective tissue cells, formative activity is easily awakened, and it happens that in many cases of hydrocephalus, stimulation of these cells by some irritating substance results in an active proliferative process, which involves not only the ependyma, but the sub-ependymal tissues of the aqueduct of Sylvius. The exact nature, source and means of access of such damaging stimuli are not always readily determined, and with the exception of the possible influence of syphilis and bacterial invasion of the meninges, ependyma and choroid plexus, there

remains to be studied more closely the causal effects of circulating toxic by-products of foetal or maternal metabolism, and variation in function of the endocrine glands. In the author's series syphilis had not operated as a known aetiological factor, with the exception of one case; showing the *Spirochæta pallida* in the cerebral tissues.

(169) Cerebro-Spinal Fluid in Anterior Poliomyelitis.

Many investigators have endeavoured to discover some clinical or laboratory test specific for anterior poliomyelitis, especially in its early stages. So far they have failed, though several of their results have been of value in making a diagnosis. Early and immediate isolation of the organism of poliomyelitis is so far an impossibility; complement fixation and agglutination tests with human serum and the globoid bodies have yielded uniformly negative results, so that at present there is no immunological test of practical value in the diagnosis of acute poliomyelitis in any stage of the disease, except, perhaps, the neutralization test, which is not adapted for widespread use. Kolmer (*Arch. of Pediatrics*, June, 1917) considers that the most constant and characteristic changes have been found in the cerebro-spinal fluid. The fluid is clear or slightly opalescent, flowing under increased pressure, poor in fibrin, reducing Fehling's solution and containing an increased number of cells, chiefly of the lymphocyte variety. An increase of protein and a high potassium permanganate reduction index strengthen the diagnosis, while a gold chloride reaction of the meningitic zone type and the presence of natural anti-sheep haemolysin are helpful diagnostic data. Since an examination of the cerebro-spinal fluid for diagnostic purposes is called for only in the early stages or in atypical cases, when the changes are likely to be slight, the technique should be accurate and delicate. This is especially true of the total cell count, and it is advisable to make this examination as soon as possible after collection of the fluid; the ideal method is to make the total cell count and a protein test at the bedside.

(170) Aetiology of Mongolian Imbecility.

The various theories brought forward to account for the occurrence of mongolian imbecility in a family have been that the condition is due to (1) worry, emotional shock, or disease of the mother during pregnancy; (2) immaturity or exhaustion of the generative organs, especially of the mother; (3) pressure on the basal ganglia, as shown by the short antero-posterior diameter of the skull, the flat occiput and the diminished weight of the cerebellum, pons and medulla; (4) congenital syphilis, or a condition directly or indirectly due to the syphilitic poison affecting the germ cells of the parents or the endocrine organs of the child itself. Herrman (*Arch. of Pediatrics*,

July, 1917) considers that all these theories are incorrect, and suggests that, as many of the congenital anomalies so often associated with mongolian imbecility, are known to be inheritable according to Mendelian law, and as many others are probably transmitted in the same way, the various peculiarities of skull, brain, face, etc., of the mongolian imbecile are also inheritable according to Mendelian principles. If this assumption be correct, mongolian imbecility is a "recessive unit character," and the condition is transmitted by an apparently normal "carrier" who has within him the peculiarity in a concealed, latent or recessive form. The author exhibits several pedigrees and charts in support of his contention.

(171) Heat and Infant Mortality.

Infant mortality has always been strikingly high as compared with the general mortality rate in the proportion usually of about ten to one. Two points relative to infant mortality have been noted. First, the increase comes mainly in the summer quarter of the year. Second, the great cause is gastro-intestinal disease. Du Bois (*Arch. of Pediatrics*, July, 1917) considers that too much attention has been paid to these gastro-intestinal disorders and their bacterial origin, to the great neglect of the heat factor. Infant metabolism is on a higher plane than that of adults, the infant requiring per kilo twice as many calories as an average man at work. The skin temperature of the infant is higher than that of the adult, and therefore any interference with heat conduction or radiation has its effect more quickly in the former. The infant's heat regulating apparatus does not respond with the same efficiency as the adult, hence the extreme necessity for careful regulation of the room temperature and clothing for the infant. Experiments have shown that, at a temperature of 31° C., the infant wearing light cotton apparel, the point is approached where heat loss by conduction and radiation is no longer possible. Excessive heat depresses the anabolic processes, increases metabolism, prevents normal gain in weight, decreases appetite and gastric and intestinal secretions, while diminishing the resistance of the organism to intestinal bacteria. The early summer mortality follows the variable temperature curve closely, the late summer mortality shows a broad high curve of infant deaths due to the persistence of a high indoor temperature, the result of prolonged heating of the dwellings by the summer sun. As regards the food element, it is over-feeding that does harm, though, of course, the presence of specific infection in the food is of very serious import. To sum up, the physician must (1) decrease heat production by giving less food, more suitable food and more water; (2) increase heat elimination by scant, permeable clothing, better ventilation and frequent baths; (3) guard against infection through food and otherwise; and (4) educate the mother.

British Medical Association News.

SCIENTIFIC.

A meeting of the New South Wales Branch was held at the B.M.A. Building, 30-34 Elizabeth Street, Sydney, on October 12, 1917, Dr. R. Gordon Craig, the President, in the chair.

Dr. V. Marano and Dr. J. B. Cleland presented a case of epithelial cast of the male urethra and exhibited the specimen. The former read the notes of the case.

A man, aged 41 years, single, had been suffering from prostatitis for some years. On June 4, 1917, he had had sexual intercourse with a woman, whom he considered to be safe. On the following day he suffered great pain along the whole length of the urethra and scalding during micturition, which was very frequent. There was no visible discharge. He had had pain of this description before. The pain usually lasted for a few days and was accompanied by some whitish mucous discharge. He had been treated by several medical practitioners without benefit. He had also been operated on for stricture. The attack on June 5, was not allayed by the injection of a weak solution of permanganate of potassium and warm applications. He therefore instilled "two or three drops" of liniment of chloroform, aconite and belladonna into the urethra, as he has experienced great relief from this liniment when applied for backache. The pain and scalding got better during the night, but returned on the following day. He then made a more liberal application to the urethra. The pain thereupon became very intense. On the following day he consulted Dr. Marano. He was required to pass urine into a glass vessel. Toward the end of the act, he passed what appeared to be a complete cast of the lining membrane of the urethra. One end of the specimen was rounded and smooth, while the other end was frayed and tapering for about 1.25 cm. There were three or four brown spots scattered along the cast. The colour was similar to that of the liniment. This colouration disappeared after a few hours' immersion. In three or four days, all the symptoms disappeared. After a further four or five days, the original pain and discharge reappeared. In conclusion, Dr. Marano referred to the experience which had been made with a quack pseudoremedy, known as the "Orange Lily" suppositories.

Dr. J. B. Cleland stated that he had cut sections of the membrane and found that it was composed of several layers of squamous epithelium. It was obviously an epithelial cast of the lining membrane of the urethra. It resembled, in microscopical appearance, the epithelial casts of the vagina, which were obtained after the use of certain pessaries containing alum. These pessaries were recommended for various purposes, but were probably not intended to procure abortion. In Western Australia, some years ago, capsules containing boracic acid had been foisted on the public. The patients were told that the "corruption giving rise to the affection" would come away after the use of the capsules. He read a paragraph published in the *British Medical Journal* of June 6, 1914, on uterine fibroids and quackery, in which the exposure of at least one French charlatan by Dr. Le Lorier was referred to. He also read an account of a unique case of exfoliation of squamous epithelium in connexion with a cold-blooded murder of a child in Western Australia. The patient was under the care of Dr. Cuthbert.

Pieces of whitish membrane were obtained from the mouth and similar material was passed *per rectum*. Bacteriological examination failed to reveal any diphtheria bacilli, while a microscopical examination of the membrane showed that it was composed of stratified epithelium, with concentric onion-like areas of flattened epithelial cells, evidently the sites of papillæ. No clinical signs had been found to account for the exfoliation. The child died, and a partial post-mortem examination was made in the presence of the mother. The stomach was the site of petechial extravasation, but little else was discovered. The mother refused permission for the oesophagus to be examined, on the plausible ground that the incision would disfigure the corpse. Dr. Cleland did not entertain any suspicion of foul play, but Dr. Cumpston, who was with him, thought that the circumstances justified suspicion. Later, another child

in the same house ran away and gave certain information. The woman was not the mother of the child, but was living with its father. It then transpired that this woman had systematically applied spirits of salt to the back of the child's throat and had eventually killed the child. The death of another child under similar circumstances was reported. The woman was tried for murder, found guilty and hanged.

Dr. S. Sheldon related the case of a medical student who was suffering from scabies without knowing what was the matter with him. The itching, which affected the scrotum, was intense and lasted for six weeks. He applied a 2% ointment of oleate of mercury. This had the effect of bringing away a complete cast of the scrotal skin, like the skin of a snake.

Dr. W. F. Litchfield said that the exfoliation referred to reminded him of the exudation in fibrinous bronchitis. He admitted that the likeness was merely in superficial appearance. He asked permission to make a digression, suggested by the subject of fibrinous bronchitis, in order to ask the pathologists present whether they had noticed the appearance of the lung after death from pure asphyxia. He had been struck by the fact that they were light and dry, without any engorgement when the blocking was complete.

Dr. A. A. Palmer was inclined to believe that the "Orange Lily" cases were still going on. These suppositories were stated to be composed of boracic acid, alum and opium. They caused a great amount of exfoliated tissue to be separated and to come away. This naturally impressed the patients very much. In reply to Dr. Litchfield, he owned that he had not noted a dry condition of the lung in pure asphyxia. In the post-mortem examinations he had been called upon to carry out, when death was due to asphyxia, the lungs were engorged and oedematous. He said that he did not often meet with cases of diphtheria in the post-mortem room. Usually the membrane extended well down into the lung.

Dr. R. Gordon Craig spoke of an old lady who was supposed to be suffering from a disease of her bladder. He maintained that she passed pieces of membrane in the urine. At first Dr. Craig had thought that the pieces shown him were exfoliated portions of the vesical mucous membrane. A microscopical examination, however, disproved this suggestion. The pieces of material were sodden portions of a refined brand of British-made toilet paper.

Drs. Marano and Cleland replied briefly.

Dr. Harold F. J. Norrie demonstrated the patient on whom he had performed a heterogeneous implantation of the sciatic nerve of a cat to replace a defect in the peroneal nerve. The case had been reported to a meeting of the New South Wales Branch on April 13, 1917 (see *The Medical Journal of Australia*, May 5, 1917, p. 277). The President had then invited him to show the patient later, and in complying with this request, he was pleased to report that there had been complete restoration of muscular power and practically complete return of sensation. The operation had been performed seven months before.

Dr. N. D. Royle expressed the opinion that no muscular fibres had been involved at all. He was inclined to regard the paresis that followed the excision of the nerve as a functional condition.

Dr. A. A. Palmer pointed out that the nerve at the situation involved was purely a superficial sensory nerve. The area supplied by this nerve was also covered in the distribution of two other sensory nerves. He was doubtful whether any regeneration had taken place in the divided nerve.

Dr. R. Gordon Craig pointed out that in his criticism at the previous meeting he had been misled by the terms employed. He had formed the idea that the tumour and portion of the nerve removed had been situated just below the head of the fibula, where the peroneal nerve was a mixed nerve. On seeing the patient, it was at once patent that the nerve at the site of the operation was entirely a cutaneous sensory nerve. He had demonstrated that after the insertion of heterogeneous nerve tissue, nerve fibres have recovered their function. He was not prepared to say whether this was on account of the implantation or merely after it. He then dealt briefly with the subject of the artificial cultivation of cells and especially the cells of the chicken's heart. He showed that in these experiments, it

was fibrous tissue which took on the growth. Turning to the experience of surgery, he pointed out that there was usually great difficulty in preventing sensory nerves from uniting, when section was undertaken for neuralgic conditions. In spite of all measures, the nerve would regenerate in *tic douloureux* and the symptoms recur. He was inclined to believe that if Dr. Norrie had been content to leave the nerve untouched, the lost sensation would have reappeared. He thanked Dr. Norrie for having brought the case up. It had led to an interesting discussion.

In his reply, Dr. Norrie said that he did not claim that the whole of the returned sensation had been due to new nerve fibres growing along the path.

The following have been nominated for election as members of the New South Wales Branch:

- Alfred Joseph Hope, M.B., Ch.M., 1917 (Univ. Sydney), c/o Messrs. F. Curtis & Son, Solicitors, Lyndhurst Chambers, Elizabeth Street, Sydney.
- Ernest Edward Griffiths, L.R.C.P., Edin., L.S.A., Lond., M.R.C.S., 1881, Roslyn Hall, Manly.
- Samuel Stoops Gardiner, M.B., 1915 (Univ. Sydney), Hamilton, N.S.W.
- George Elliott Hobson, M.B., Ch.M., 1916 (Univ. Sydney), "Tuxedo," Albert Road, Homebush.

Naval and Military.

Since we went to press last week, three casualty lists have been published. In the 348th there were 1,472 names; in the 349th there were 1,052, and in the 350th there were 1,359, making a total of 3,883. Of this number, 1,174 are names of those killed in action, died of wounds or died of other causes. The first list contains a record of the death of Major Gladstone Montague Hunt, M.C., who was killed in action (see *The Medical Journal of Australia*, October 27, 1917, page 361). It is reported that Major James Beverley Metcalfe, who was previously reported ill, has been severely wounded. The following officers are reported to have been wounded:—Lieutenant-Colonel Clive Wentworth Thompson, Major Herbert Locksley St. Vincent Welch, Captain Francis Lawrence Bignell and Captain Phillip Sidney Parkinson.

We learn that Major Gother Robert Carlisle Clarke and Captain Eric John Kerr have been killed in action, and that Major Noel Edmund Barton Kirkwood, M.C., has been wounded.

Lieutenant-Colonel W. W. Hearne has received a decoration from the King of Italy.

Captain Wendell Inglis Clark has been awarded the Military Cross.

The *Commonwealth of Australia Gazette*, No. 186, of November 1, 1917, contains the announcement of the following appointments, etc.:—

Army Medical Corps.

Major R. W. Chambers is granted the temporary rank of Lieutenant-Colonel whilst commanding No. 17 Field Ambulance. Dated 12th June, 1917.

To be Majors—

- Captain W. D. Kirkland, M.C., Captain S. V. Appleyard, Captain G. R. C. Clarke, Captain J. McPherson, Captain J. A. Murphy, Captain R. E. Dunn, Captain F. A. Gray, Captain A. S. Clowes, Captain G. A. M. Heydon, M.C., Captain E. L. Hutchinson, Captain R. B. North, Captain G. M. Hunt, M.C., Captain R. M. Bowman, Captain D. Gwynne Hughes, Captain R. E. Craig, Captain A. G. Owen, Captain H. I. Carlile, Captain W. Evans, Captain A. J. MacDonald, Captain A. J. Mollison, Captain C. H. Wesley, Captain N. E. B. Kirwood, Captain C. K. Parkinson, M.C., Captain E. K. Parry, Captain (temporary Major) C. J. Tozer, Captain D. Bennett, Captain H. B. Lee, Captain W. A. Morton, Captain S. B. Burge, Captain E. W. Griffiths, Captain F. L. Wall, M.C., Captain K. N. Steele, Captain A.

McKillop, Captain C. B. Pym. Dated 20th June, 1917.

Australian Military Forces.

Appointments, etc.

His Excellency the Governor-General, acting with the advice of the Federal Executive Council, has been pleased to approve of the following changes, etc., in connexion with the Australian Military Forces, viz.:—

1st Military District.

Australian Army Medical Corps—

Captain (provisionally and temporarily) F. S. Thomas is transferred to Australian Army Medical Corps Reserve and is Honorary Captain. Dated 8th February, 1917.

Captain (provisionally and temporarily) J. K. Patrick is transferred to Australian Army Medical Corps Reserve and is Honorary Captain. Dated 15th October, 1917.

Honorary Captains E. McL. Smith, A. C. Ward, and R. V. Graham are transferred from Australian Army Medical Corps Reserve and are Captains (provisionally and temporarily). Dated 1st July, 1917.

Captain W. J. Fearnley is transferred from Unattached List and is Captain (temporarily). Dated 1st July, 1917.

The appointment of Honorary Captain L. M. McKillop as temporary Major at No. 13 Australian General Hospital is terminated. Dated 19th February, 1917.

Australian Army Medical Corps Reserve—

Charles Emanuel Williams is Honorary Captain. Dated 2nd April, 1916. (This cancels the notification respecting date of appointment of this officer which appeared in Executive Minute, No. 511/1916, promulgated on page 1261 of *Commonwealth of Australia Gazette*, No. 66, of 1st June, 1916.)

Alexander Christie McArthur is Honorary Captain. Dated 16th January, 1916.

2nd Military District.

Australian Army Medical Corps—

Honorary Captain A. T. Chapple is transferred from Australian Army Medical Corps Reserve and is Captain (provisionally and temporarily). Dated 1st August, 1917.

Honorary Captain R. U. Russell is transferred from Australian Army Medical Corps Reserve and is Captain (provisionally and temporarily). Dated 1st September, 1917.

Australian Army Medical Corps Reserve—

Carl Herman Seaforth is Honorary Captain. Dated 15th April, 1917.

Oscar Rudolph Percy Muller and Edgar Joseph Rowbotham are Honorary Captains. Dated 5th September, 1917.

John Murray Sanderson is Honorary Captain. Dated 26th September, 1917.

3rd Military District.

Australian Army Medical Corps—

Captain R. N. Wawn is transferred to Australian Army Medical Corps Reserve and is Captain. Dated 15th October, 1917.

Captain J. H. Pollock is transferred to Australian Army Medical Corps Reserve and is Captain. Dated 1st August, 1917.

Major F. D. Jermyn, V.D., is transferred from Australian Army Medical Corps, 4th Military District, with seniority as from date of transfer. Dated 27th July, 1917.

Edwin Henry William Eldridge is Secretary, No. 5 Australian General Hospital (temporarily), with honorary rank of Lieutenant, and pay at rate of £250 per annum, inclusive of all allowances except travelling, whilst holding such appointment. Dated 15th September, 1917.

The appointment of Honorary Major A. Honman as Officer Commanding No. 5 Australian General Hospital, with temporary rank and pay of Lieu-

tenant-Colonel, is terminated. Dated 21st September, 1917.

Australian Army Medical Corps Reserve—

Archibald Simpson Anderson and Colin Hasler Martin are Honorary Captains. Dated 6th April, 1915.

Harold Alfred Cardale Irving is Honorary Captain. Dated 18th May, 1915.

Frank Harold Looney is Honorary Captain. Dated 20th May, 1915.

Henry Howick Holland is Honorary Captain. Dated 20th August, 1915.

James McCusker is Honorary Captain. Dated 23rd August, 1915.

Robert Marriott William Webster is Honorary Captain. Dated 1st October, 1915.

William Joseph Newing, Joseph Thomas Hollow, Charles Ellis Jelbart, and Arthur Joseph Day are Honorary Captains. Dated 15th October, 1917.

Honorary Captain C. H. Johnson is granted temporary rank and pay of Major, at rate prescribed by Financial and Allowance Regulation 340, whilst employed as Senior Medical Officer, Military Hospital, Langwarrin. Dated 16th October, 1917.

4th Military District.

Australian Army Medical Corps—

Captain (Honorary Lieutenant-Colonel) A. J. Meikle from Unattached List is Lieutenant-Colonel (temporarily), with pay at rate prescribed by Financial and Allowance Regulation 340, whilst employed as President, Permanent Medical Referee Board. Dated 26th August, 1917.

Major F. D. Jermyn, V.D., is transferred to Australian Army Medical Corps, 3rd Military District, with seniority as from date of transfer. Dated 27th July, 1917.

Australian Army Medical Corps Reserve—

Lionel Wykeham Hayward is Honorary Captain. Robert McMahon Glynn is Honorary Captain, Dated 20th September, 1917.

Claude Witherington Stump is Honorary Captain. Dated 28th September, 1917.

Honorary Captain E. C. East is transferred to Australian Army Medical Corps, 5th Military District, with seniority as from date of transfer. Dated 1st July, 1917.

5th Military District.

Australian Army Medical Corps—

Honorary Captain W. J. Beveridge is transferred from Australian Army Medical Corps Reserve, and is Senior Medical Officer, Australian Imperial Force Camp (temporarily), with temporary rank and pay of Major, at rate prescribed by Financial and Allowance Regulation 340, whilst holding such appointment. Dated 22nd September, 1917.

The appointment of Honorary Captain T. J. Longan as Senior Medical Officer, Australian Imperial Force Camp, with temporary rank and pay of Major, is terminated. Dated 21st September, 1917.

Australian Army Medical Corps Reserve—

Oscar Arnold is Honorary Captain. Dated 18th August, 1917.

Honorary Captain D. D. Paton is Honorary Major (temporarily) whilst employed as Specialist, No. 8 Australian General Hospital. Dated 23rd August, 1917.

Honorary Captain E. C. East is transferred from Australian Army Medical Corps Reserve, 4th Military District, with seniority as from date of transfer. Dated 1st July, 1917.

6th Military District.

Australian Army Medical Corps—

Major (Honorary Lieutenant-Colonel) H. N. Butler, D.S.O., is Officer Commanding No. 9 Australian General Hospital (temporarily), with pay at rate of £300 per annum, whilst holding such appointment (part-time). Dated 1st August,

1917. (This cancels the notification respecting appointment of this officer which appeared in Executive Minute, No. 596/1917, promulgated on page 2447 of *Commonwealth of Australia Gazette*, No. 155, of 13th September, 1917.)

Honorary Lieutenant-Colonel A. H. Thwaites, A.A.M.C. Reserve, is Staff Officer to Director-General, Australian Army Medical Services (temporarily), with pay consolidated at rate of £685 per annum, inclusive of all allowances except travelling, whilst holding this position. Dated 20th October, 1917.

Major (temporarily) T. F. W. Hall is Staff Officer to Director-General, Australian Army Medical Services (temporarily), with temporary rank and pay of Lieutenant-Colonel at rate prescribed by Financial and Allowance Regulation 340 when actually employed on Military duty. Dated 22nd October, 1917.

Major (temporarily) R. F. O'Sullivan is to be Staff Officer to Director-General, Australian Army Medical Corps, with pay as for rank of Major at rate prescribed by Financial and Allowance Regulation 340 when actually employed on Military duty. Dated 16th October, 1917.

Captain A. J. Meikle has been awarded the Colonial Auxiliary Forces Officers' Decoration.

THE HEALTH OF BROKEN HILL.

The Medical Officer of Health of Broken Hill has issued a report covering the quarter ending July 30, 1917.

Vital Statistics.

For the purposes of estimating the birth and death rates, the population of the municipality was taken to be 31,000. During the quarter 227 births were registered, 132 being of males and 95 of females. The birth-rate, expressed as an annual birth-rate, was 29.29 per 1,000 of population. The rate for the corresponding quarter of the preceding three years was 37.65. There were 87 deaths registered during the quarter, 60 of females and 27 of males. The death-rate was equivalent to an annual death-rate of 11.22 per 1,000 of population, which compares favourably with the average for the corresponding quarter of the preceding three years, viz., 16.58. The number of deaths of infants under one year of age was 23. The infantile mortality was therefore 101.32 per 1,000 births. The infantile mortality for the corresponding quarter of the preceding three years was 95.9.

Infective Diseases.

The prevalence of enteric fever was considerably lower than in other years. During the second quarter of 1917, 23 cases were notified, as compared with 48 in 1916, 41 in 1915, and 181 in 1914. The same improvement was not seen in connexion with diphtheria. During the quarter under review 193 cases were notified, and during the corresponding quarter of 1916, 1915 and 1914, 198, 163 and 183 cases were notified respectively. There were 20 cases of scarlatina, which represents the average number. No cases of cerebro-spinal meningitis were recorded.

The Medical Officer gives a few details concerning the causes of death. It appears that five persons died of diphtheria, one of enteric fever, seven of pulmonary tuberculosis, six of pneumonia and nine of gastro-intestinal diseases, including eight infants. He records eleven deaths from cardiac diseases and three from cancer.

Sanitation.

He calls attention to a report which was furnished by an officer of his Department on the sanitary condition of Broken Hill. He points out that the report was "of a far from flattering nature," but was unfortunately very true, and demanded careful consideration. He claims that the inspectorial staff is too small, "and is being altogether wrongly applied." He urges a re-organization of the whole staff. In previous reports the Medical Officer of Health has urged most strongly the removal of pits for the reception of urine from the most central part of the town. He records that this has been carried out; and that the urine is conveyed to a situation outside the town, and is being

ploughed in. The situation has been chosen without sufficient preliminary enquiry, and he anticipates that it will be a source of nuisance during the summer months on account of the stiff, impervious nature of the sub-soil. He considers that, in accordance with the Public Health Act, urine is nightsoil, and should be dealt with appropriately. Considerable improvement has been effected in the night-soil depot. Too much trench was, however, left uncovered. The hoods under which the pans were to be steamed were not ready. Pans were still being sealed without aeration, causing objectional odour, and a sufficient supply was not available.

He again calls serious attention to the fact that about one-fifth of the sanitary services is being carried out under the old night-cart system. Instructions have repeatedly been given by the Department of Public Health to abolish this obsolete method, but the local authority has ignored these instructions, year after year. Many of the gutters in the city paved with stone are in bad repair, and constitute traps for the retention of sewage. The danger of such a condition of affairs is obvious. During the first quarter of the year the Medical Officer of Health condemned as unfit for habitation a large number of dwellings. This condemnation has been ignored, notwithstanding the fact that the municipality has powers to order the destruction of houses certified by the Medical Officer of Health as unfit for human habitation. His contention that the delay in carrying out the necessary work in this connexion is unjustifiable, must meet with universal approval.

A bacteriological laboratory has been established at the Hospital. It is proposed to carry out diagnosis and other bacteriological work of specimens from outside as well as from within the Institution. The importance of this, from the point of view of the control of diphtheria and other infective diseases, is considerable.

It seems inconceivable that the local authority of a municipality containing 31,000 persons should persistently ignore the urgent demands of its Medical Officer for the remedy of obvious sanitary defects. The result of this neglect is so serious that, should it be continued, it will become the duty of the Department of Public Health to take the matter out of the hands of the local authority to carry out all the recommendations of the Medical Officer, and to compel the municipality to pay for the work done.

INFECTIVE DISEASES.

The Bulletins of the Quarantine Service issued on September 28 and October 12, 1917, contain the following information:—

Variola.

Four cases of variola have been notified in New South Wales between September 25 and October 11, 1917. From the Dutch East Indies information has been received concerning 144 cases with 30 deaths, since the publication of Bulletin No. 19. There were nine cases with two deaths at Zamboanga, in the Philippine Islands, during the fortnight ending September 15, 1917. Two cases have been reported at Portland, Oregon, U.S.A., during the fortnight ending June 9, and one at San Francisco during the fortnight ending September 8, 1917. According to the Bill of Health dated September 4, 1917, sporadic cases of small-pox have occurred at Calcutta.

Plague.

The number of cases of plague notified between July 22 and August 18 was 20,078. During the same period there were 14,361 deaths. Between June 29 and August 16, 133 cases and 73 deaths were notified in Egypt. Six fatal cases have been notified in Java. There were five cases between July 22 and August 4 in Ceylon, and six cases with three deaths during the four weeks ending October 7, in the Straits Settlements. There was one fatal case in South Africa toward the end of July, and another in Hong Kong early in August. Three plague-infected rats were found at Seattle, Washington, U.S.A., between March 16 and March 28, 1917.

Cholera.

In the Philippine Islands 181 cases with 121 deaths were notified between August 15 and August 20. In the Dutch East Indies 40 cases have occurred and nine deaths since the publication of the last Bulletin. Some sporadic cases

have been observed at Calcutta at the beginning of September.

Typhus Fever.

The following information is derived from the Public Health Reports issued by the United States Public Health Service for the period from July 21 to August 17, 1917:—

Place.	Cases.	Deaths.
Egypt	818	246
Mexico	238	—
Russia	104	—
China	6	—
Algeria	5	3
Japan	4	—
Netherlands	3	2
Switzerland	1	—
Trinidad	2	—
Greece	—	17
Spain	—	5
Great Britain	—	1
Portuguese East Africa	—	1
Tunis	—	1

Special Correspondence.

(By Our Special Correspondent.)

LONDON LETTER.

The General Medical Council.

The 105th Session of the General Medical Council was opened on May 22, 1917, when the usual inaugural address was delivered by Sir Donald MacAlister, the President.

In the course of his remarks, he said that the question whether the time had come for a more effective system of professional "mobilization," for a temporary measure of general control, extending to all practitioners, and directing their distribution according to the nation's need for service, had been brought by several medical bodies before Mr. Neville Chamberlain. Definite proposals on the better distribution of their resources were adopted at a conference of professional committees and Government departments, and were now under consideration by the Government. The conclusions of a similar conference with the British Dental Association had also been communicated to the Government. The sources of supply for service abroad and at home were becoming severely strained, and many branches of ordinary civil work must suffer curtailment. It was doubtful whether, without fresh legislation, the present powers of the authorities concerned would suffice to cope with all the demands of the situation. Practitioners would respond to the limit of their power to further calls, should the needs of the country make further calls imperative; but to ensure the best results from their devotion a closer co-ordination of competing authorities, and a more effective control of the actual distribution of medical services at home and abroad were now much to be desired. It was clear that certainly in 1918 and 1919, and probably in the present year, there would be a serious falling off in the number of practitioners added to the register. In 1920 and 1921, however, they might expect an increase, both of men and women. The need for an amendment of the Dentists Act was urgent. Serious delay would only make more difficult the question of providing for the military and civil requirements. The already insufficient supply of qualified dentists was suffering further reduction by the calls upon them, not for professional, but for combatant service with the forces. The outlook, both for present and for future national requirements, was not re-assuring.

Regarding the complaints of the Government departments to the General Medical Council, following an expression of the belief that laxity in giving medical certificates was prevalent in certain places, Sir Donald MacAlister said they had been examined, and the result was so far gratifying. In nearly every instance it appeared from the explanations offered, or from evidence subsequently obtained by the authorities themselves, that a charge of culpable laxity or bad faith could not properly be brought against the practitioner concerned, and the complaints had accordingly been withdrawn. In one or two instances of a somewhat different kind, a case for enquiry by the Council had been submitted.

The session was concerned almost entirely with routine business and the investigation of penal cases.

Obituary.

JOHN ROWLAND TILLETT.

When a man dies at an advanced age, it is possible to measure the value of his life to the community by surveying his works and estimating how far his achievements may reach posterity. When a young man dies, we have no such guide, and we can but form an opinion of what the world has lost from the moulding of his mind, the shaping of his character and the individuality of the man. It is possible, however, to prophesy with confidence from a study of character when a young man is destined to achieve eminence in his future career. Those who were well acquainted with John Rowland Tillett, anticipated that he would occupy an important place in medicine when experience had ripened his mind and had filled in the lacunæ inevitably left in the student's education.

John Royland Tillett was born at McMahon's Point, Sydney, on October 8, 1893. His education was undertaken at Hayfield Preparatory School and at the Sydney Grammar School. He studied medicine at the Sydney University, being a student at St. Paul's College. He took his degrees in medicine and surgery with honours in August, 1916. For four months after graduating he was a Resident Medical Officer at the Toowoomba General Hospital, while awaiting the call from the Defence Department. In January, 1917, he left Australia with the rank of Captain in the Army Medical Corps, Australian Imperial Force, and journeyed to England. He was sent to France on May 4, and for several months had charge of an advanced field dressing station, serving as the Regimental Medical Officer of the 7th Field Artillery Battery. After nearly five months on active service he was wounded by a gas shell, and succumbed to the effect of these wounds on October 2, 1917.

As a student he was very popular among his colleagues, while his teachers entertained affection for him and respect for his attainments. A large number of people sorrow at the loss of so good a friend and sympathize with his parents at the loss of so excellent a son.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser," page xviii.

Royal Alexandra Hospital for Children, Sydney, Honorary Laryngologist, Honorary Dermatologist, and Temporary Honorary Medical Officer to Out-Patients.

Medical Appointments.**IMPORTANT NOTICE.**

Medical practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, 429 Strand, London, W.C.

Branch.	APPOINTMENTS.
TASMANIA. (Hon. Sec., Belgrave, Tasmania.)	Medical Officers in all State-aided Hospitals in Tasmania.
VICTORIA. (Hon. Sec., Medical Society Hall, East Melbourne.)	Brunswick Medical Institute. Bendigo Medical Institute. Prahran United F.S. Dispensary. Australian Prudential Association Proprietary, Limited. National Provident Association. Life Insurance Company of Australia, Limited. Mutual National Provident Club.

Branch.	APPOINTMENTS.
QUEENSLAND. (Hon. Sec., B.M.A. Building, Adelaide Street, Brisbane.)	Medical Officers to the Selwyn Hospital, North Queensland. Brisbane United Friendly Society Institute.
SOUTH AUSTRALIA. (Hon. Sec., 3 North Terrace, Adelaide.)	The F.S. Medical Assoc., Incorp., Adelaide.
WESTERN AUSTRALIA. (Hon. Sec., Health Department, Perth.)	All Contract Practice Appointments in Western Australia.
	Australian Natives' Association. Balmain United F.S. Dispensary. Canterbury United F.S. Dispensary. Leichhardt and Petersham Dispensary. M.U. Oddfellows' Med. Inst., Elizabeth Street, Sydney. Marrickville United F.S. Dispensary. N.S.W. Ambulance Association and Transport Brigade. North Sydney United F.S. People's Prudential Benefit Society. Phoenix Mutual Provident Society. F.S. Lodges at Casino. F.S. Lodges at Lithgow. F.S. Lodges at Parramatta, Penrith, Auburn and Lidcombe. Newcastle Collieries — Killingworth, Seaham Nos. 1 and 2, West Wallsend.
NEW SOUTH WALES. (Hon. Sec., 30-34 Elizabeth Street, Sydney.)	Friendly Society Lodges, Wellington, N.Z. (Hon. Sec., Wellington.)
NEW ZEALAND: WELLINGTON DIVISION.	

Diary for the Month.

Nov. 13.—Tas. Branch, B.M.A., Council and Branch.
 Nov. 13.—N.S.W. Branch, B.M.A., Ethics Committee.
 Nov. 14.—Vict. Branch, B.M.A., Branch.
 Nov. 14.—North-Eastern Med. Assoc. (N.S.W.).
 Nov. 14.—Vict. Branch, B.M.A., Nomination Papers for Election of Members of Council Returned.
 Nov. 15.—Vict. Branch, B.M.A., Council.
 Nov. 20.—N.S.W. Branch, B.M.A., Executive and Finance Committee.
 Nov. 21.—W. Aust. Branch, B.M.A., Branch.
 Nov. 21.—Western Suburbs Med. Assoc. (N.S.W.).
 Nov. 23.—Q. Branch, B.M.A., Council.
 Nov. 27.—N.S.W. Branch, B.M.A., Medical Politics Committee; Organization and Science Committee.
 Nov. 27.—Vict. Branch, B.M.A., Ballot Papers for Election of Members of Council Issued.
 Nov. 28.—Vict. Branch, B.M.A., Council.
 Nov. 29.—S. Aust. Branch, B.M.A., Branch.
 Nov. 30.—N.S.W. Branch, B.M.A., Branch.
 Dec. 4.—N.S.W. Branch, B.M.A., Ethics Committee.

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